



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: BLUETOOTH CAR SPEAKER

Test Model: WS-1955

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Luo
Supervised by:	Nick Peng





A.1 -20dB Bandwidth

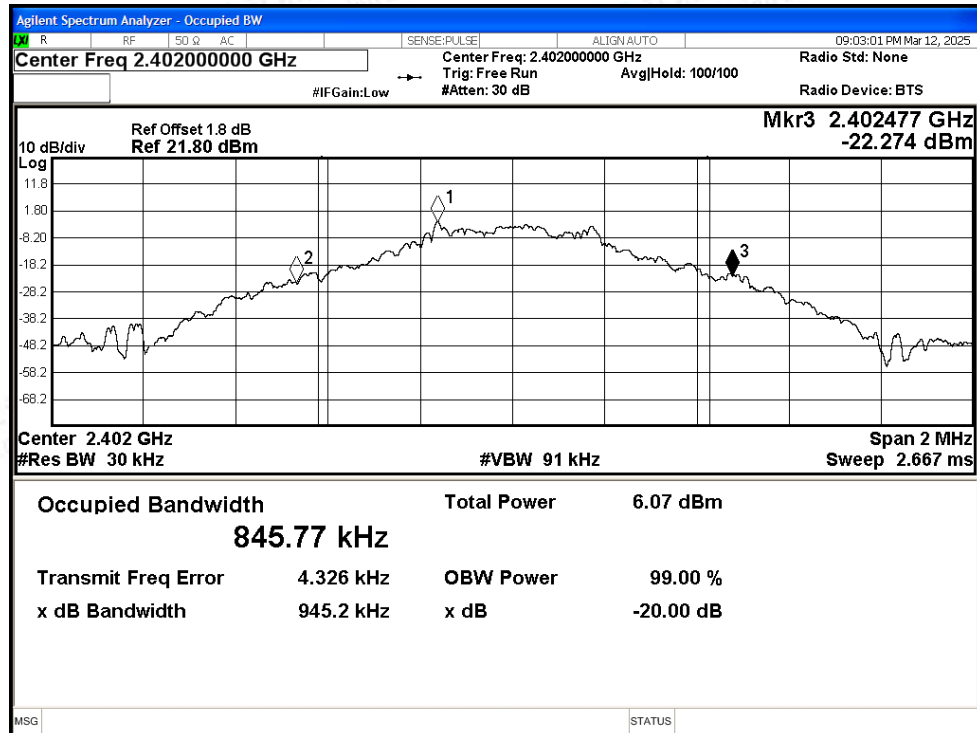
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant1	0.945	N/A	Pass
NVNT	1-DH5	2441	Ant1	0.956	N/A	Pass
NVNT	1-DH5	2480	Ant1	0.961	N/A	Pass
NVNT	2-DH5	2402	Ant1	1.285	N/A	Pass
NVNT	2-DH5	2441	Ant1	1.283	N/A	Pass
NVNT	2-DH5	2480	Ant1	1.331	N/A	Pass
NVNT	3-DH5	2402	Ant1	1.327	N/A	Pass
NVNT	3-DH5	2441	Ant1	1.329	N/A	Pass
NVNT	3-DH5	2480	Ant1	1.29	N/A	Pass



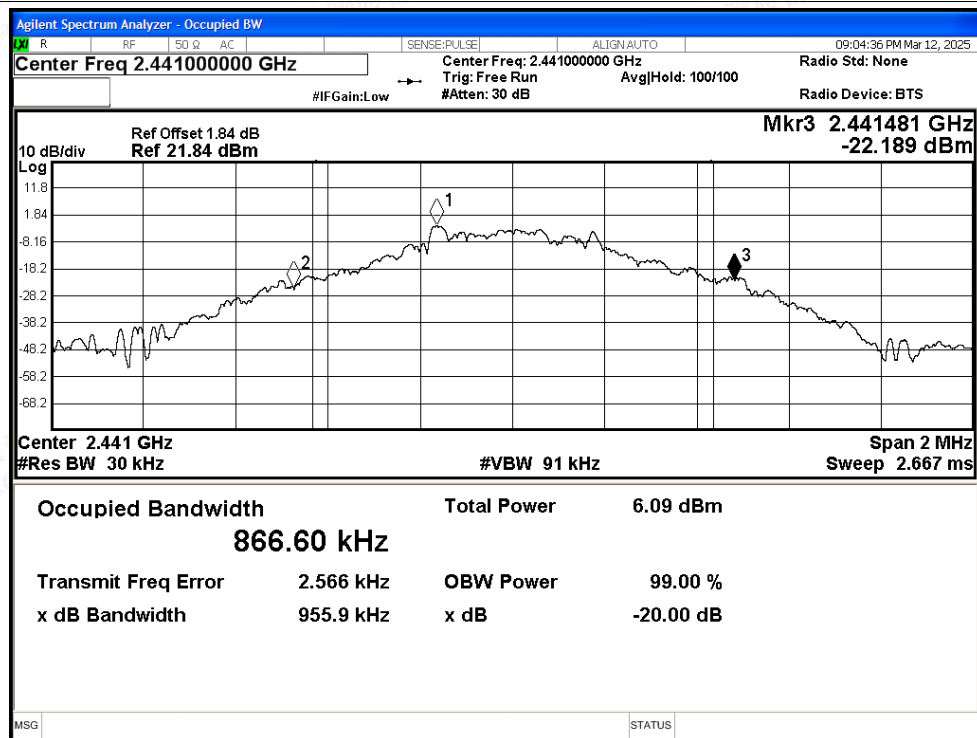


Test Graphs

-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1

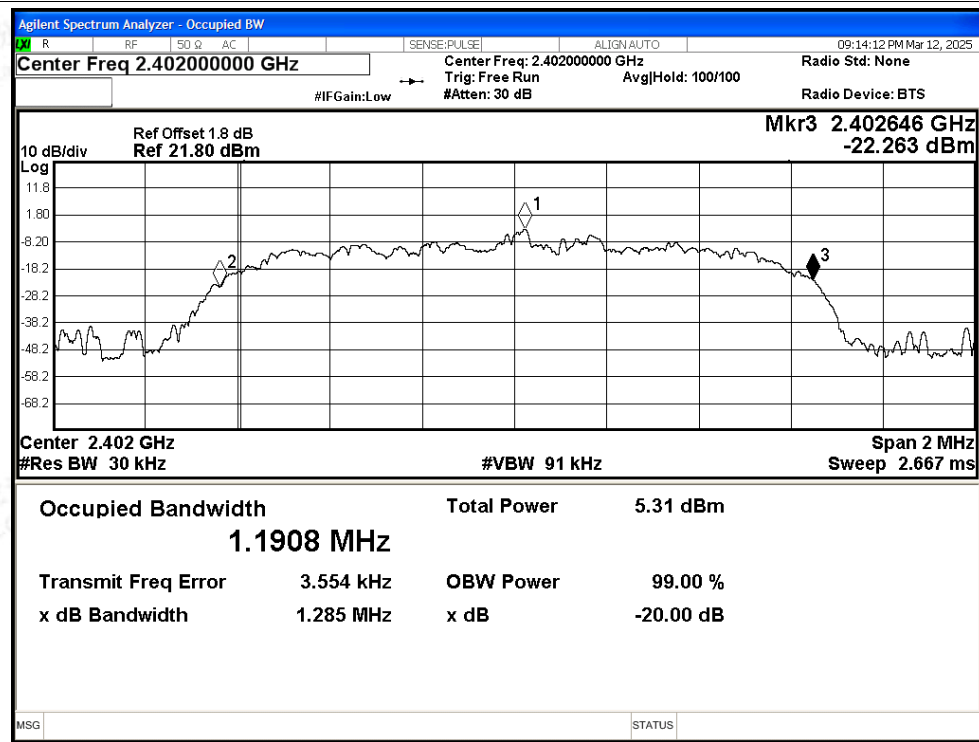




-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1

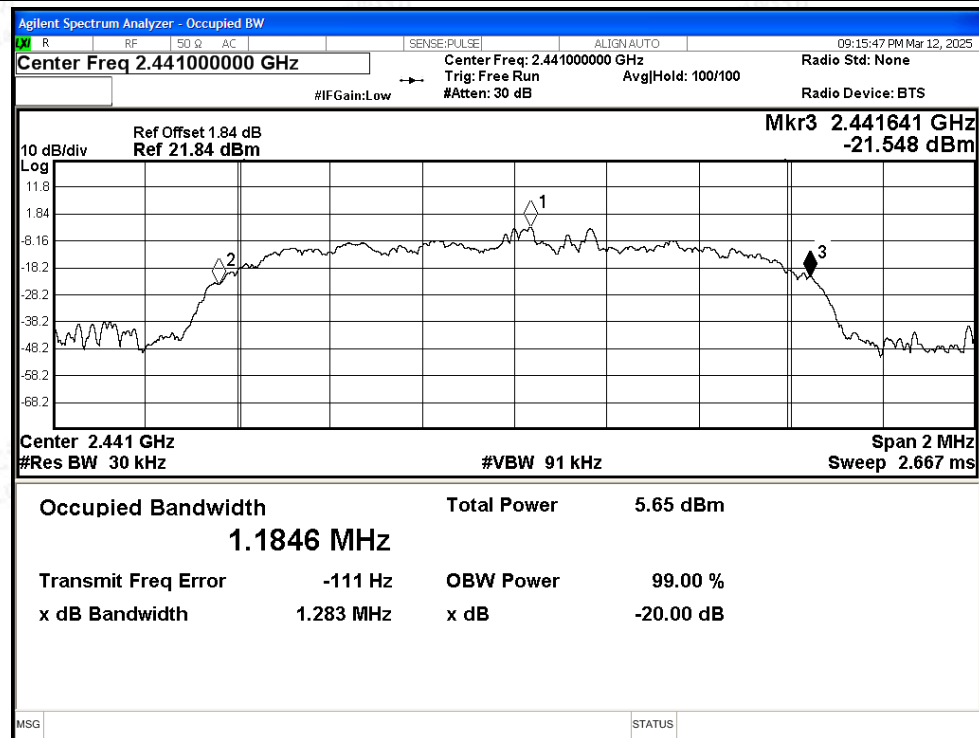


-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1

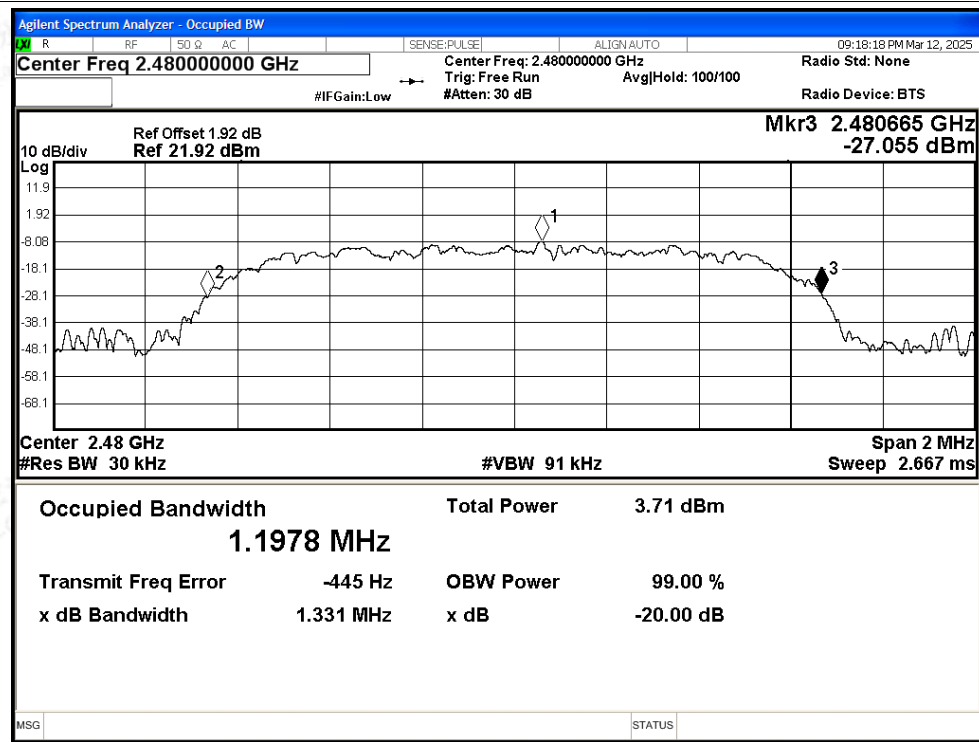




-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1

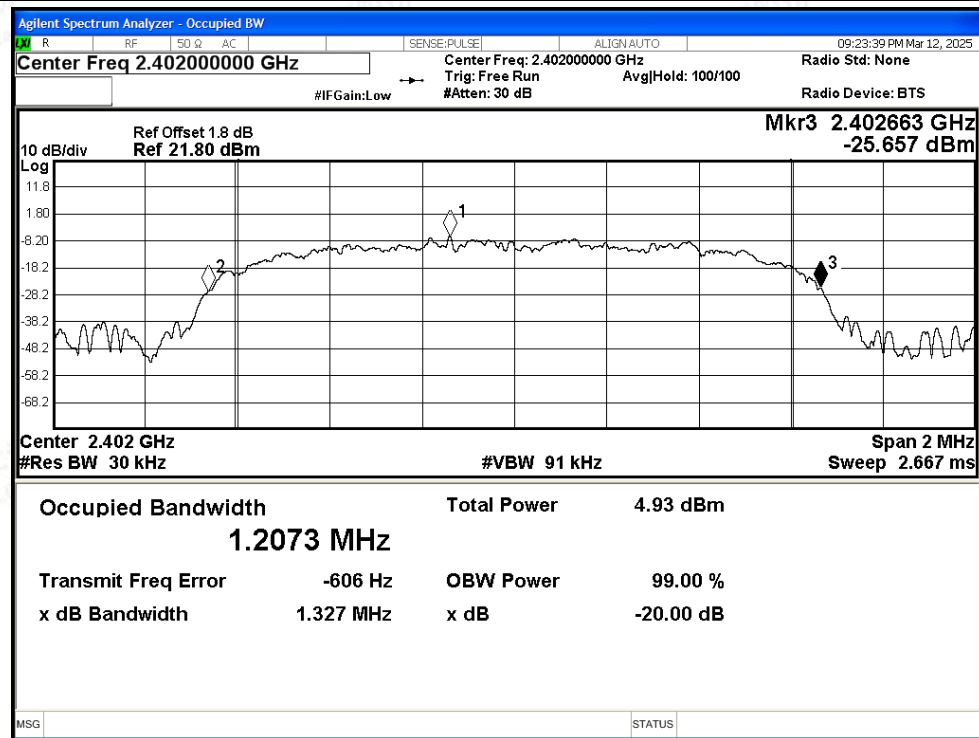


-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1

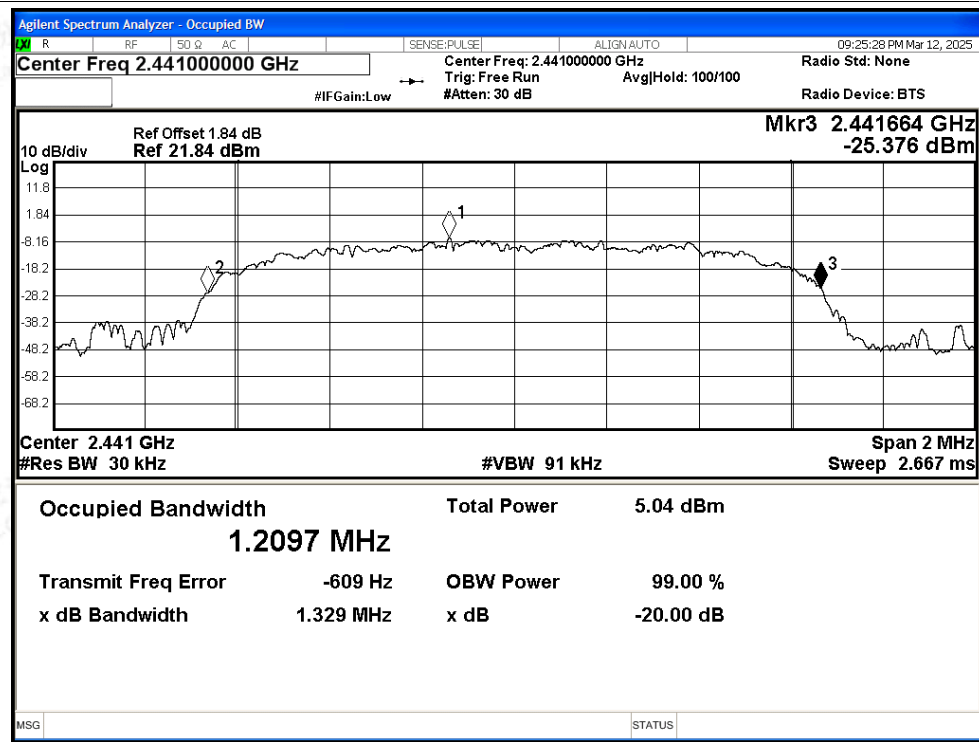


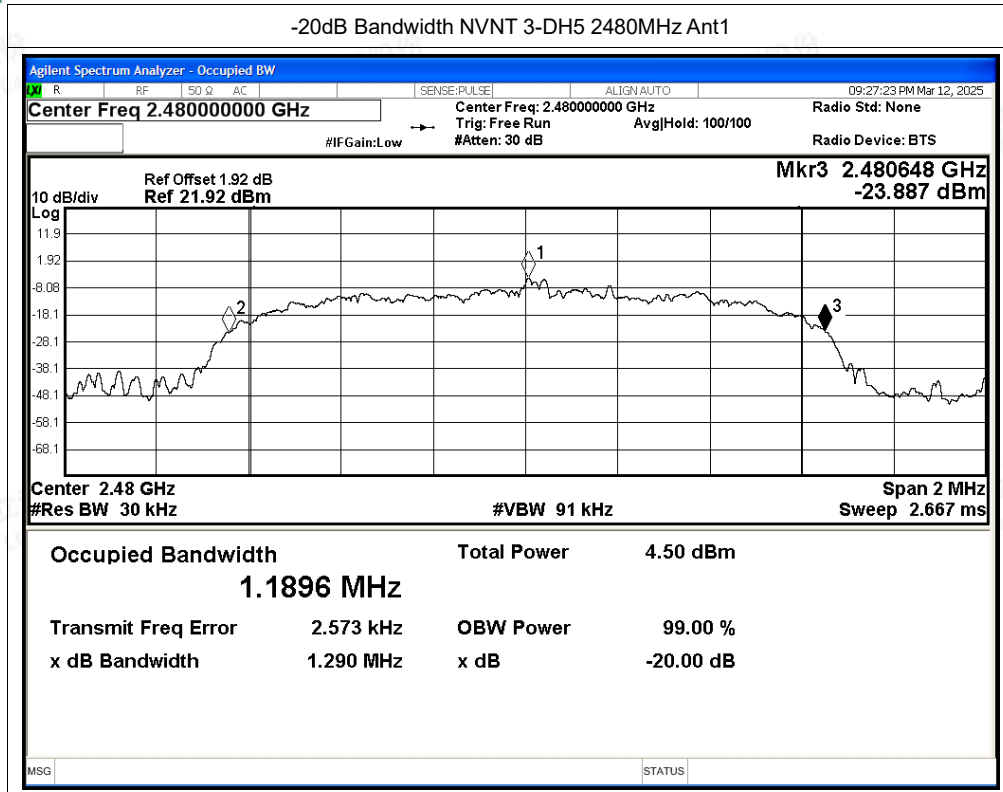


-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1







A.2 Maximum Peak Conducted Output Power

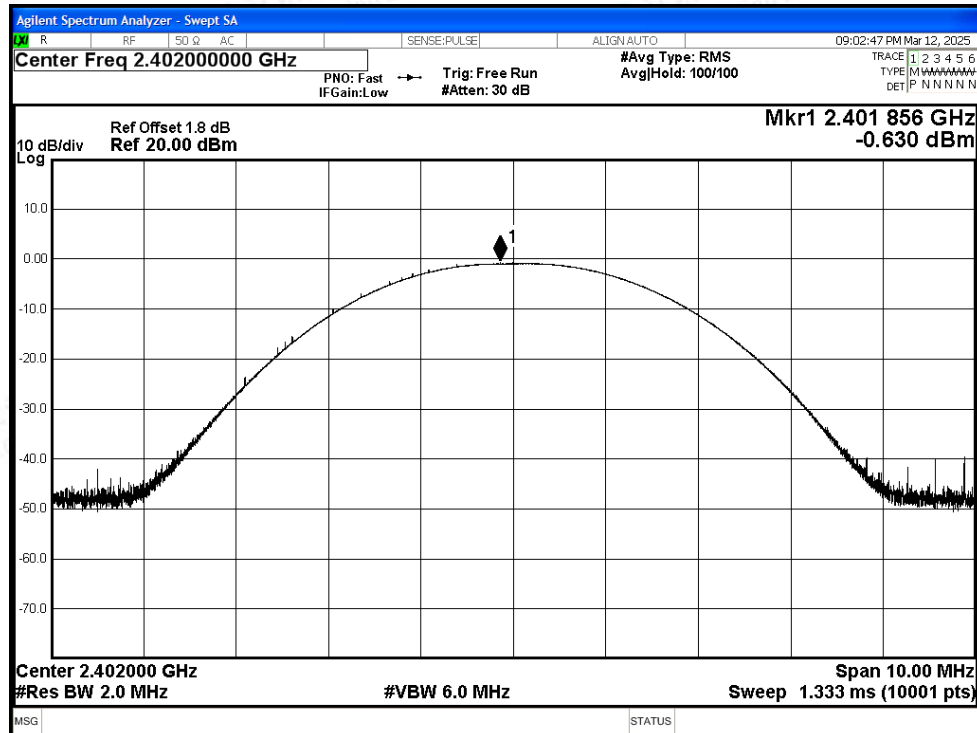
Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	-0.63	21	Pass
NVNT	1-DH5	2441	Ant1	-0.78	21	Pass
NVNT	1-DH5	2480	Ant1	-1.61	21	Pass
NVNT	2-DH5	2402	Ant1	1.15	21	Pass
NVNT	2-DH5	2441	Ant1	1.30	21	Pass
NVNT	2-DH5	2480	Ant1	0.17	21	Pass
NVNT	3-DH5	2402	Ant1	1.58	21	Pass
NVNT	3-DH5	2441	Ant1	1.80	21	Pass
NVNT	3-DH5	2480	Ant1	0.61	21	Pass



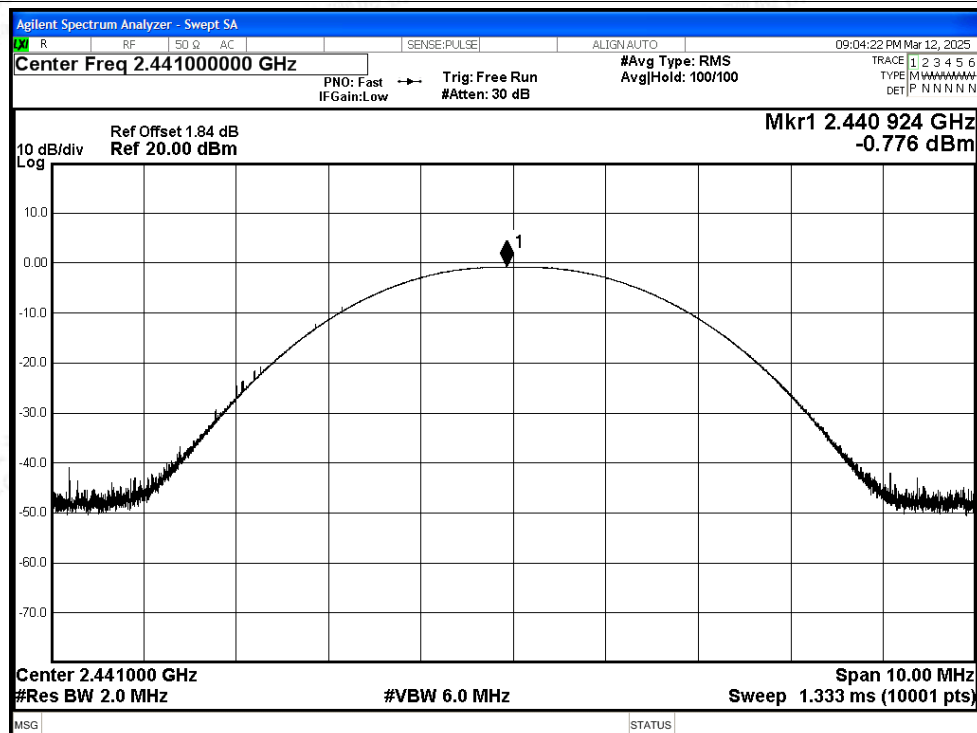


Test Graphs

Power NVNT 1-DH5 2402MHz Ant1

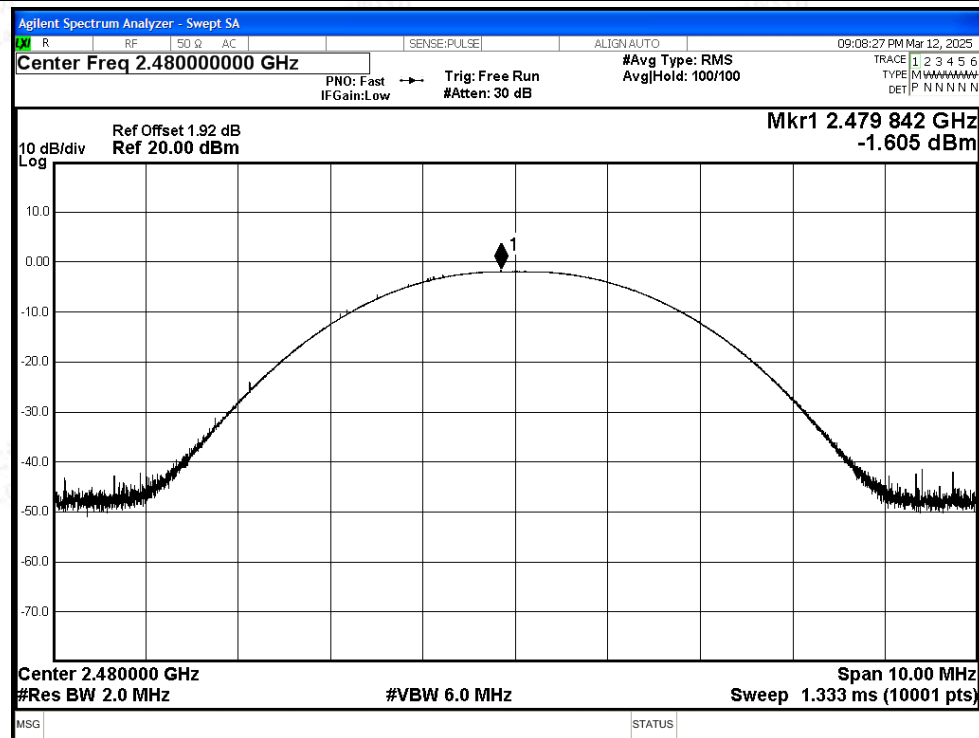


Power NVNT 1-DH5 2441MHz Ant1

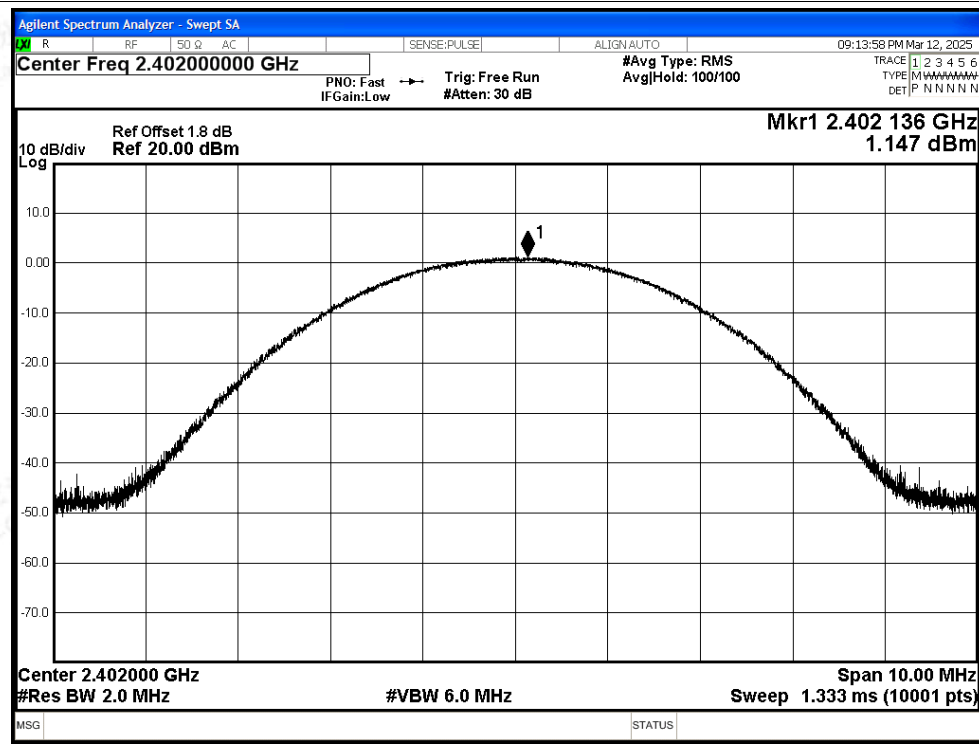




Power NVNT 1-DH5 2480MHz Ant1

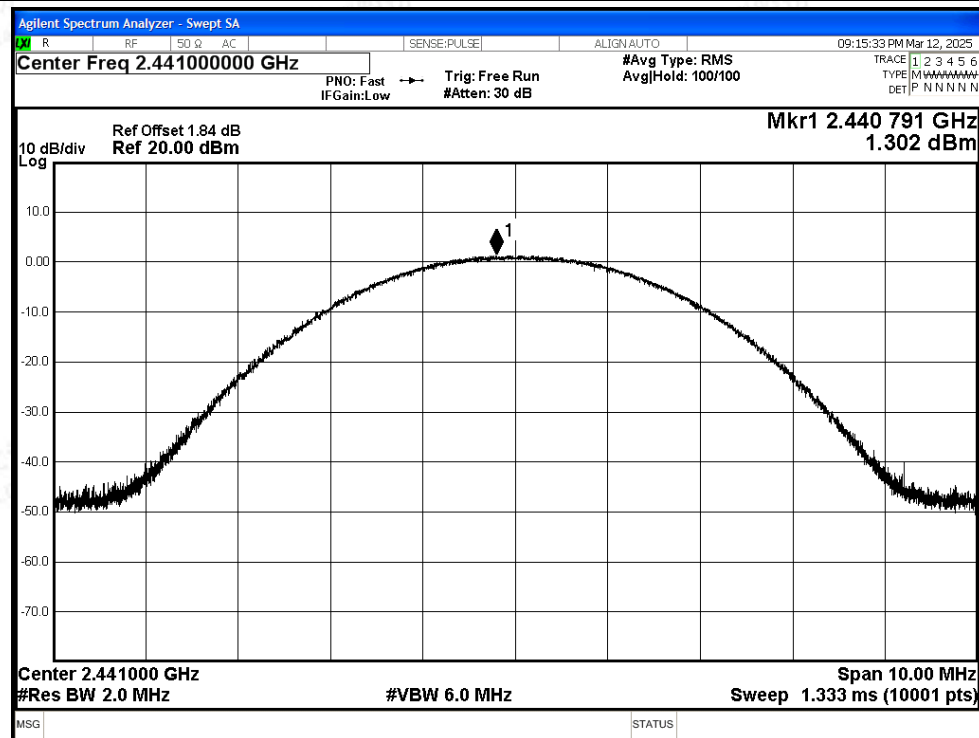


Power NVNT 2-DH5 2402MHz Ant1

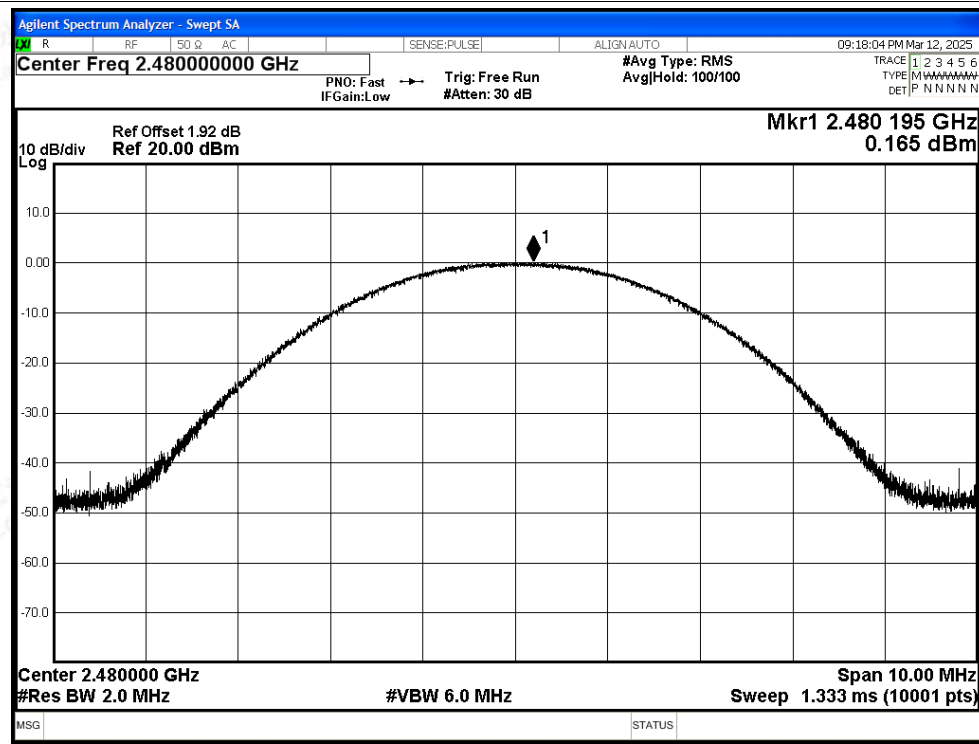




Power NVNT 2-DH5 2441MHz Ant1

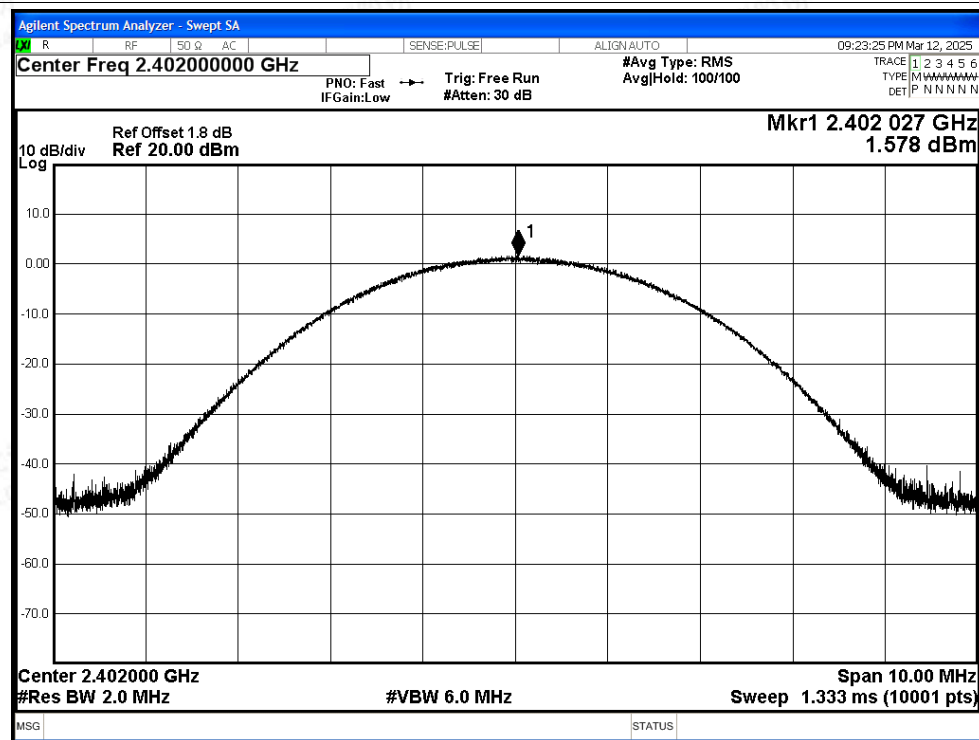


Power NVNT 2-DH5 2480MHz Ant1

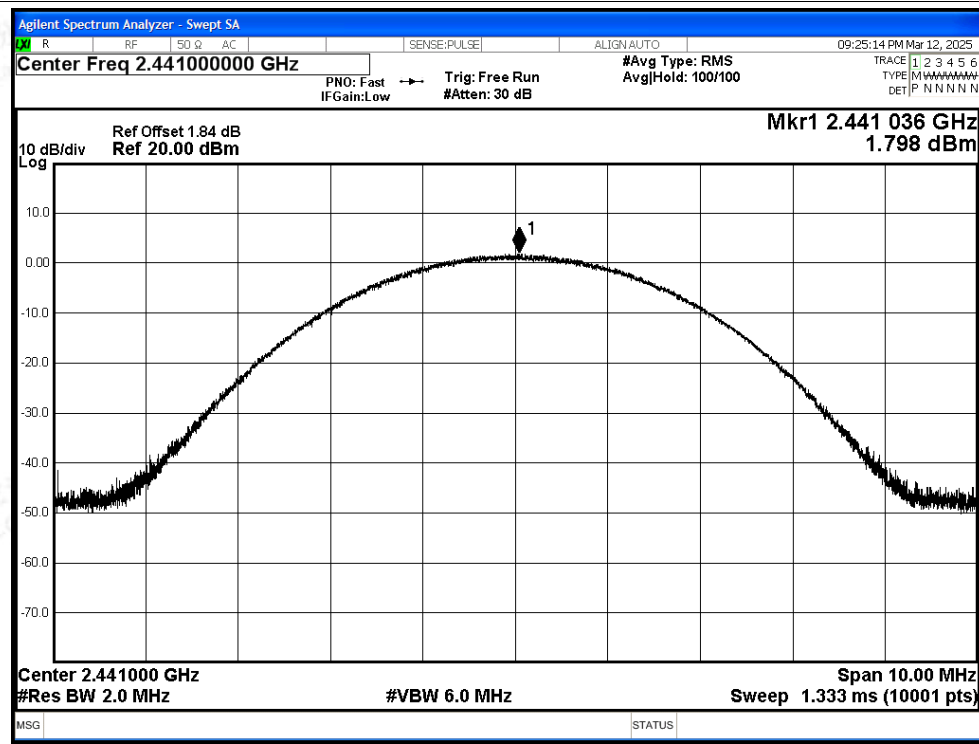


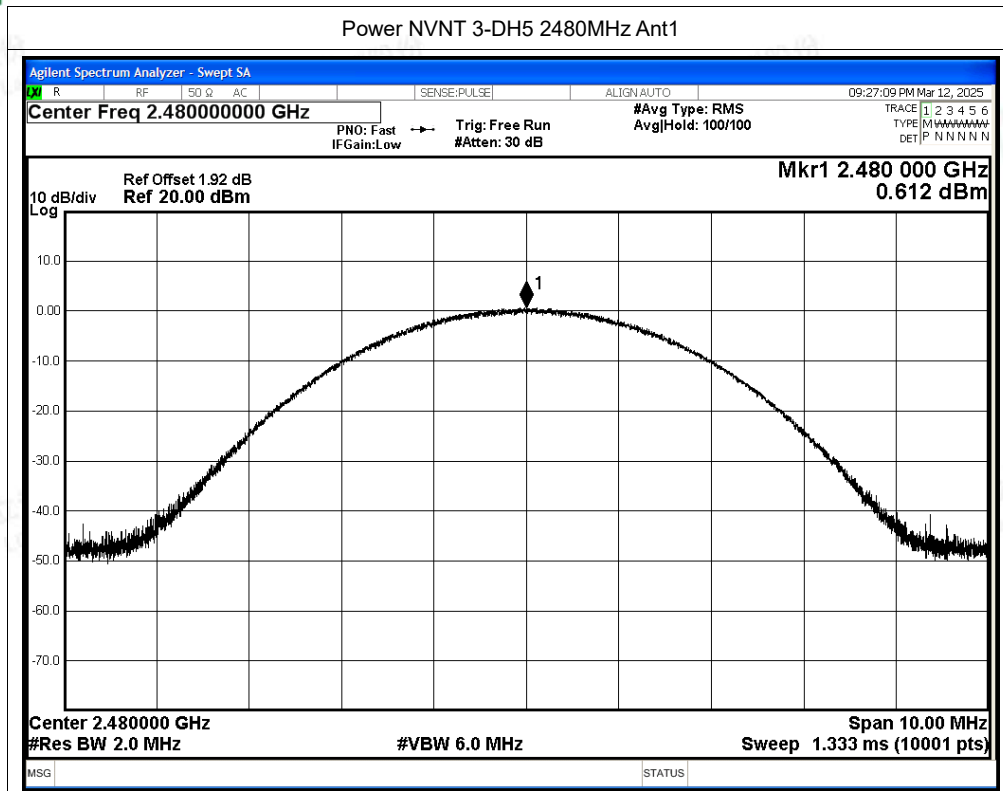


Power NVNT 3-DH5 2402MHz Ant1



Power NVNT 3-DH5 2441MHz Ant1







A.3 Carrier Frequencies Separation

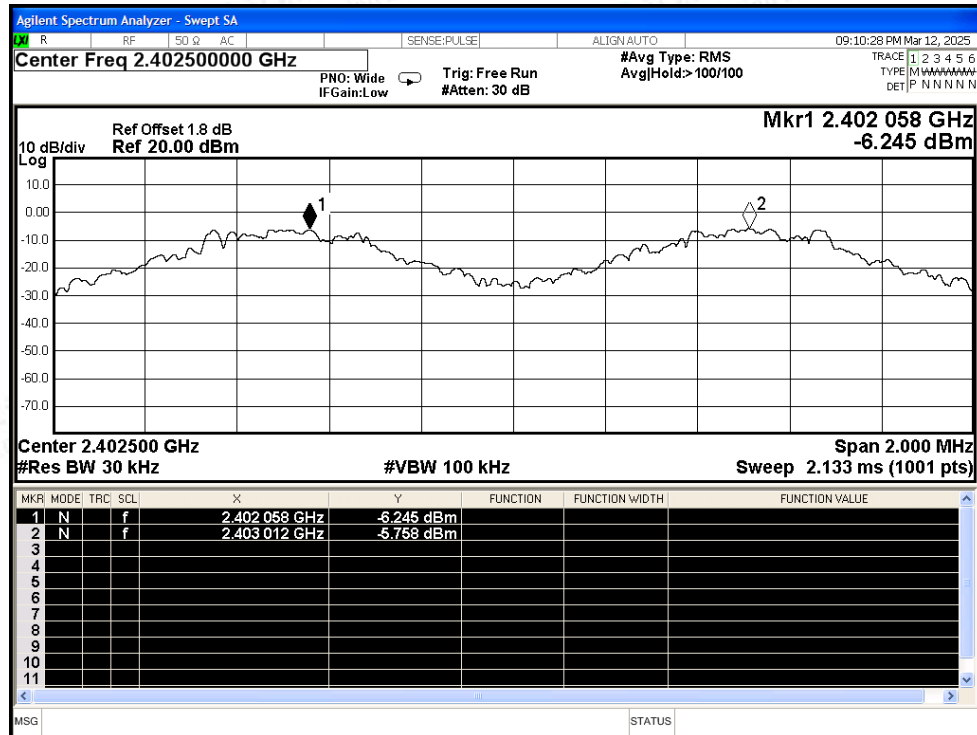
Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2402.058	2403.012	0.954	0.641	Pass
NVNT	2-DH5	Ant1	2402.02	2403.158	1.138	0.887	Pass
NVNT	3-DH5	Ant1	2402.036	2403.028	0.992	0.886	Pass



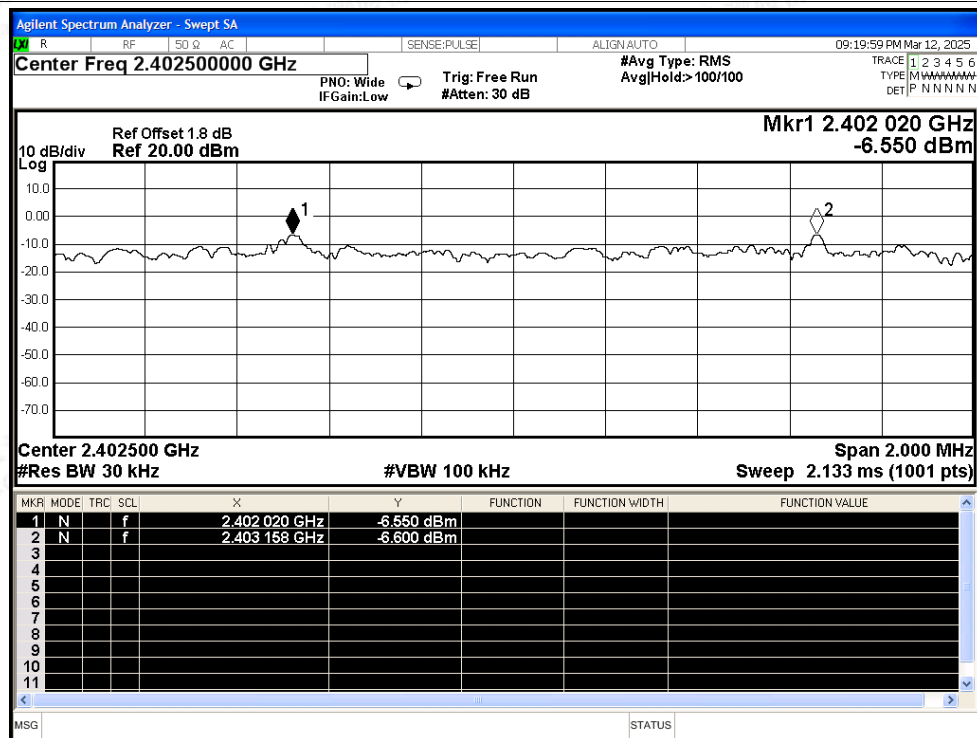


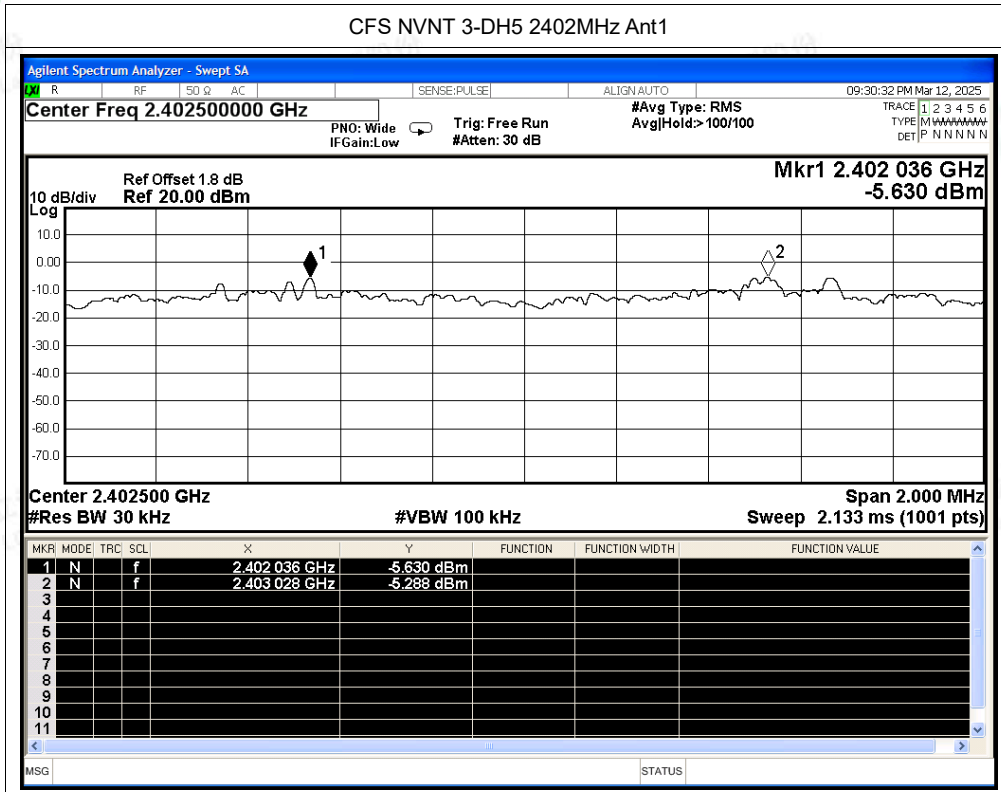
Test Graphs

CFS NVNT 1-DH5 2402MHz Ant1



CFS NVNT 2-DH5 2402MHz Ant1







A.4 Dwell Time

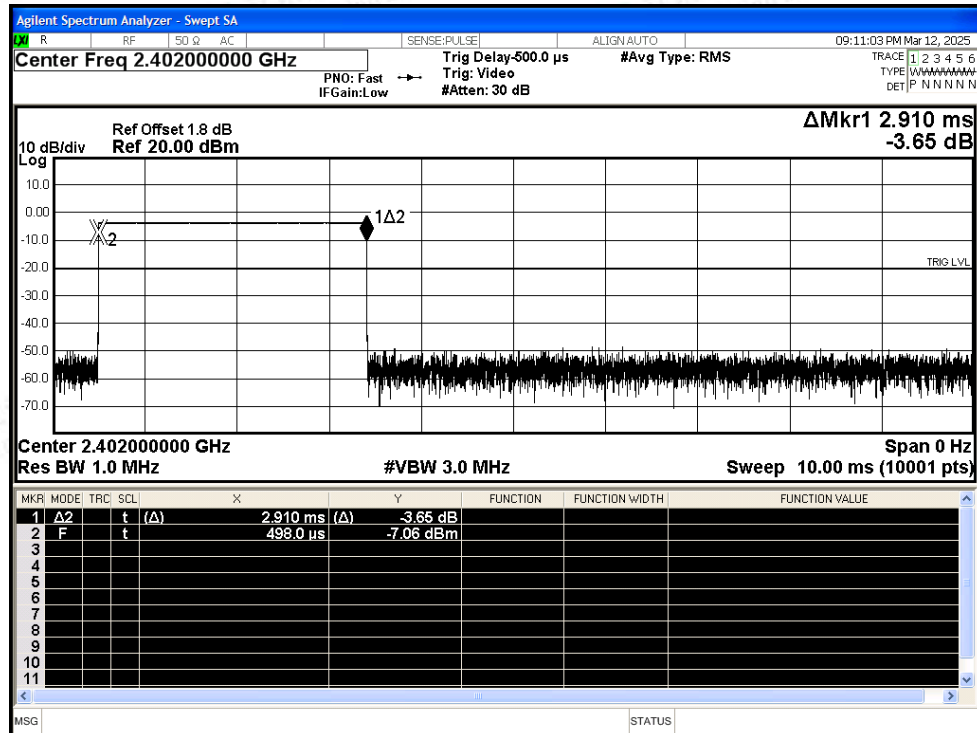
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant1	2.91	314.28	108	31600	400	Pass
NVNT	2-DH5	2402	Ant1	2.898	318.78	110	31600	400	Pass
NVNT	3-DH5	2402	Ant1	2.897	278.112	96	31600	400	Pass



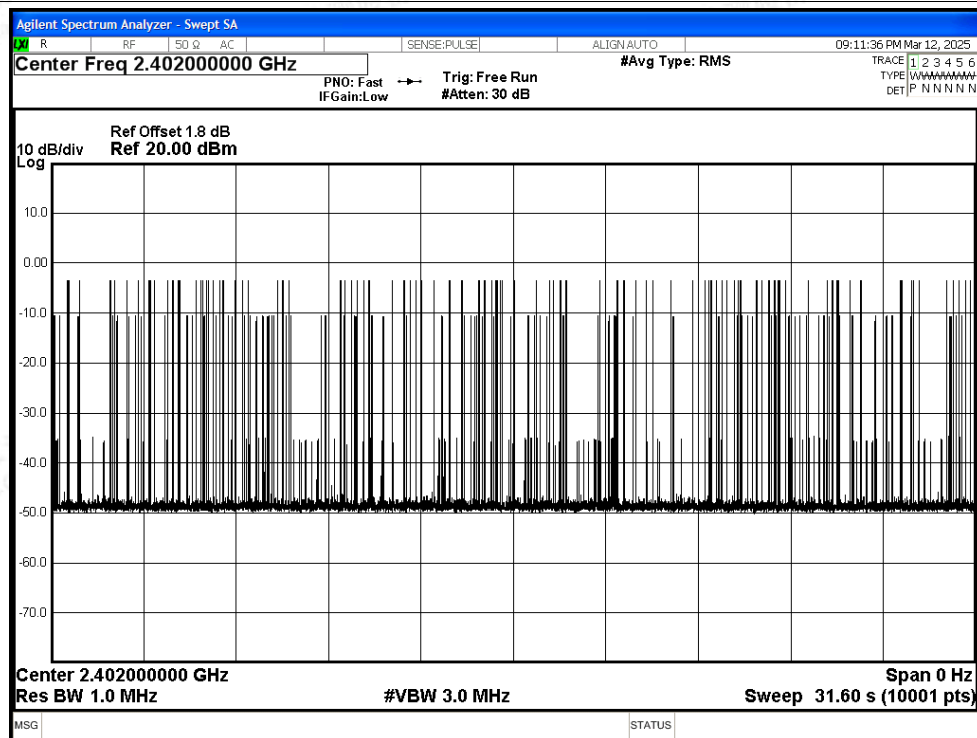


Test Graphs

Dwell NVNT 1-DH5 2402MHz Ant1 One Burst

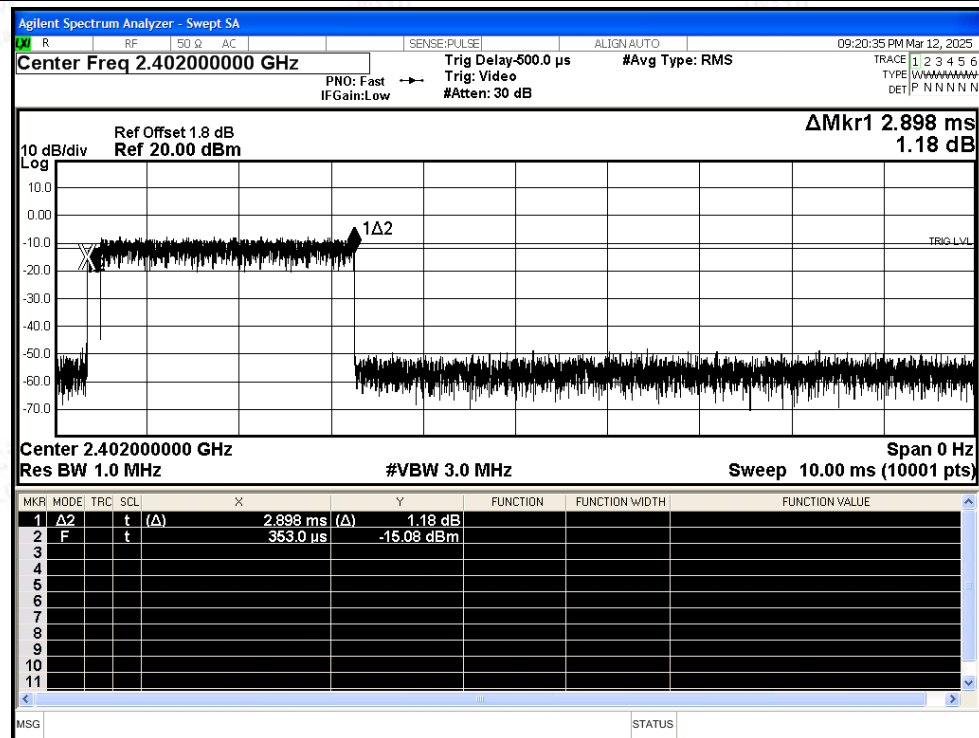


Dwell NVNT 1-DH5 2402MHz Ant1 Accumulated

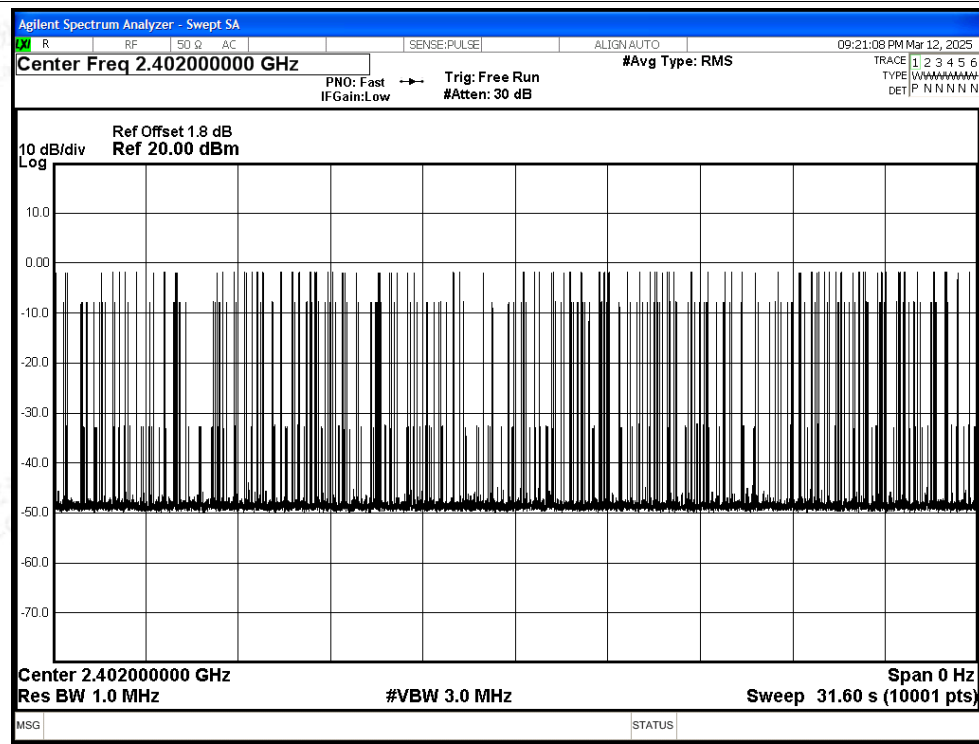




Dwell NVNT 2-DH5 2402MHz Ant1 One Burst

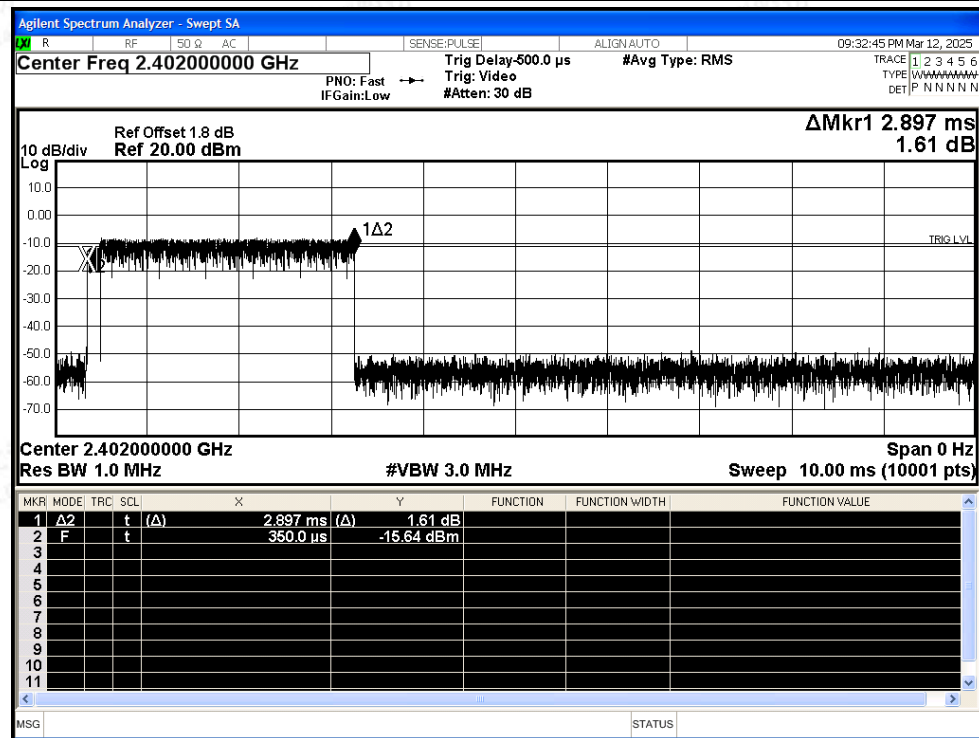


Dwell NVNT 2-DH5 2402MHz Ant1 Accumulated

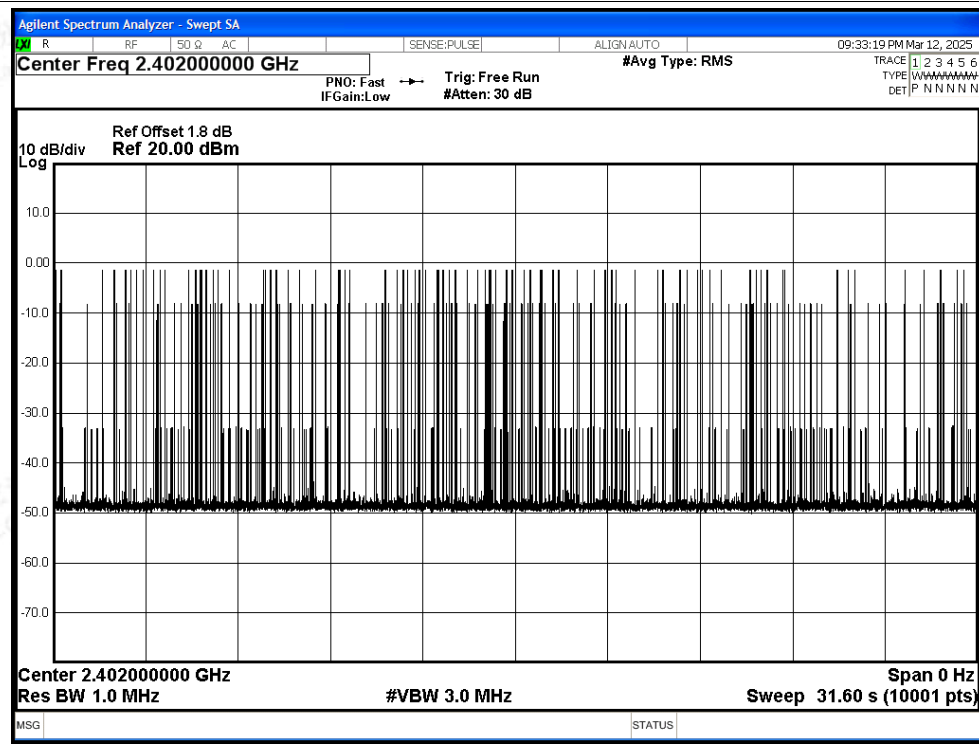




Dwell NVNT 3-DH5 2402MHz Ant1 One Burst



Dwell NVNT 3-DH5 2402MHz Ant1 Accumulated





A.5 Number of Hopping Channel

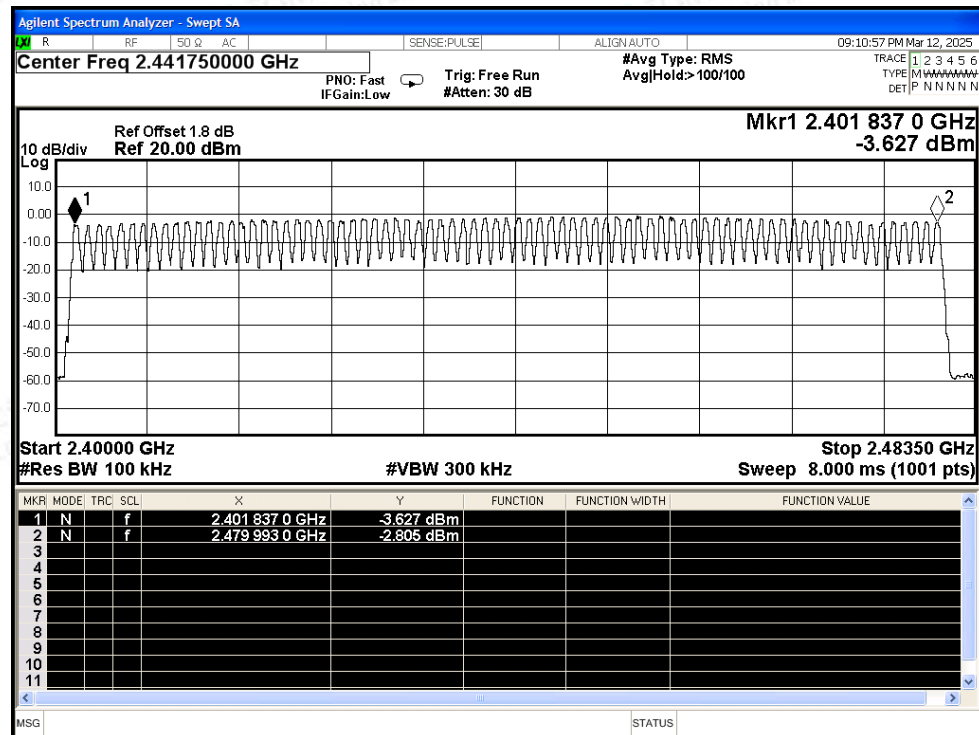
Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant1	79	15	Pass
NVNT	2-DH5	Ant1	79	15	Pass
NVNT	3-DH5	Ant1	79	15	Pass



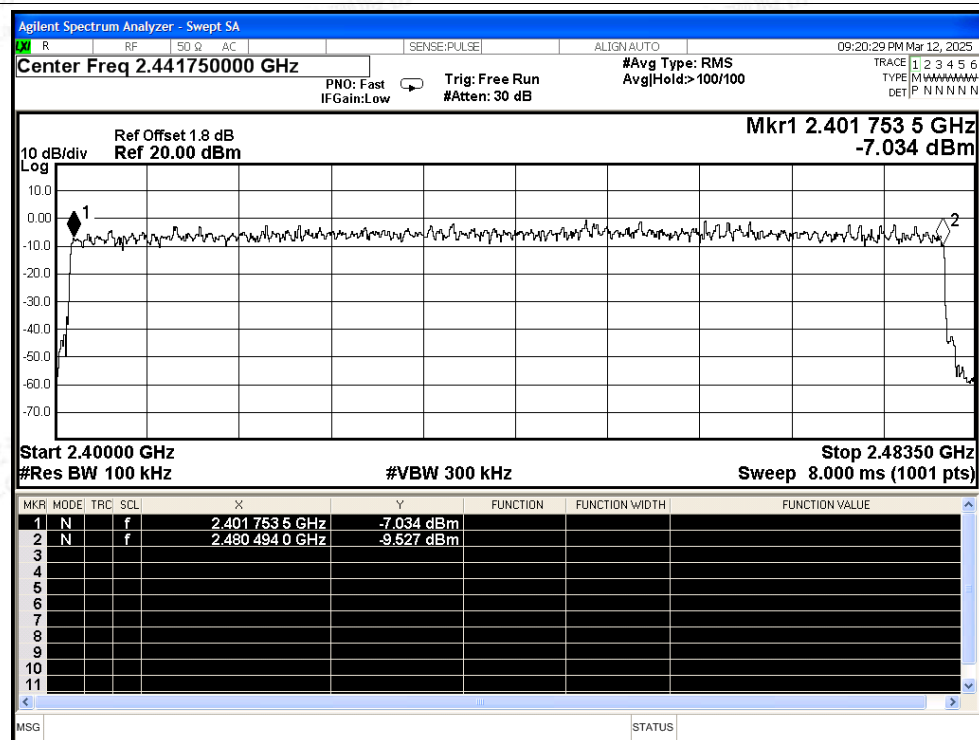


Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant1

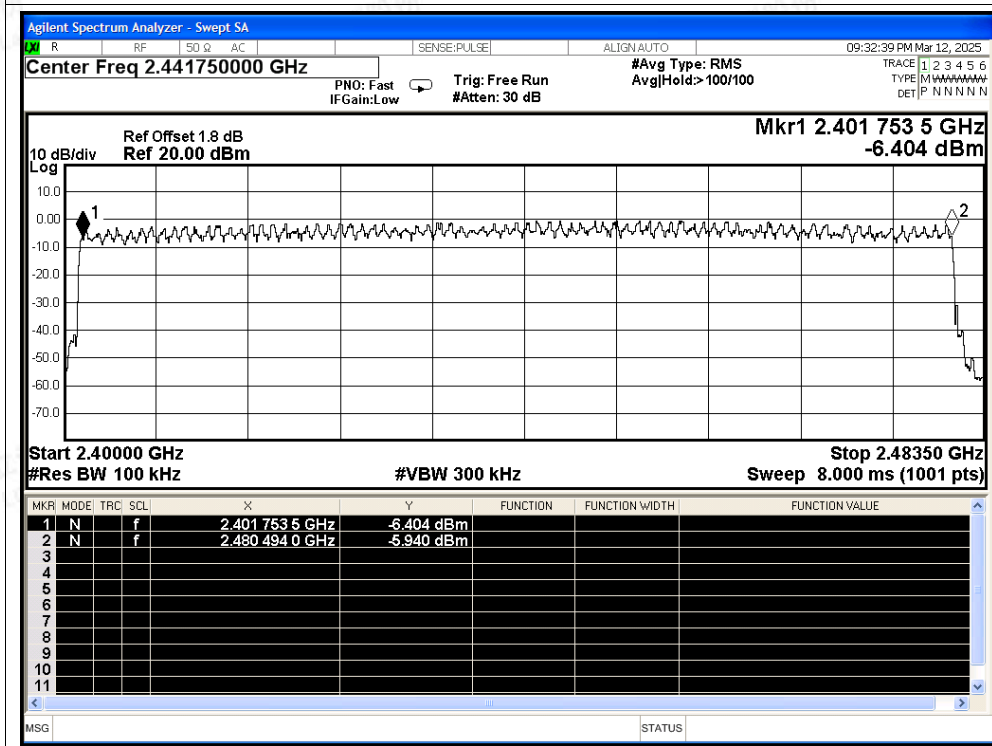


Hopping No. NVNT 2-DH5 2402MHz Ant1





Hopping No. NVNT 3-DH5 2402MHz Ant1





A.6 Band Edge

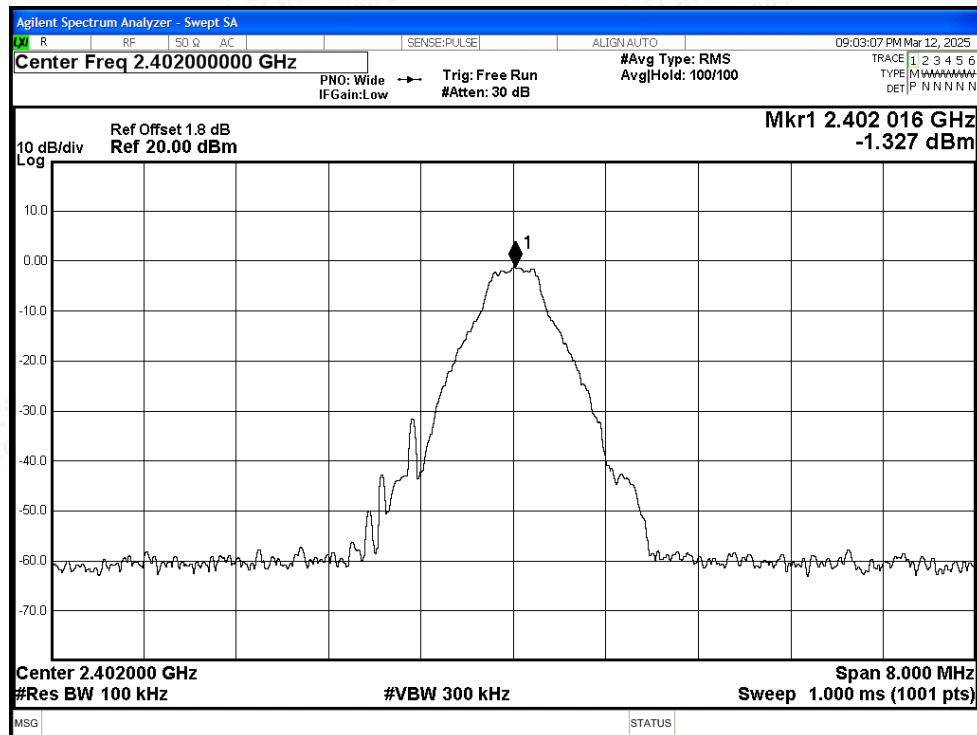
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	-55.81	-20	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	-55.26	-20	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	-51.61	-20	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	-54.08	-20	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	-52.23	-20	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	-54.86	-20	Pass



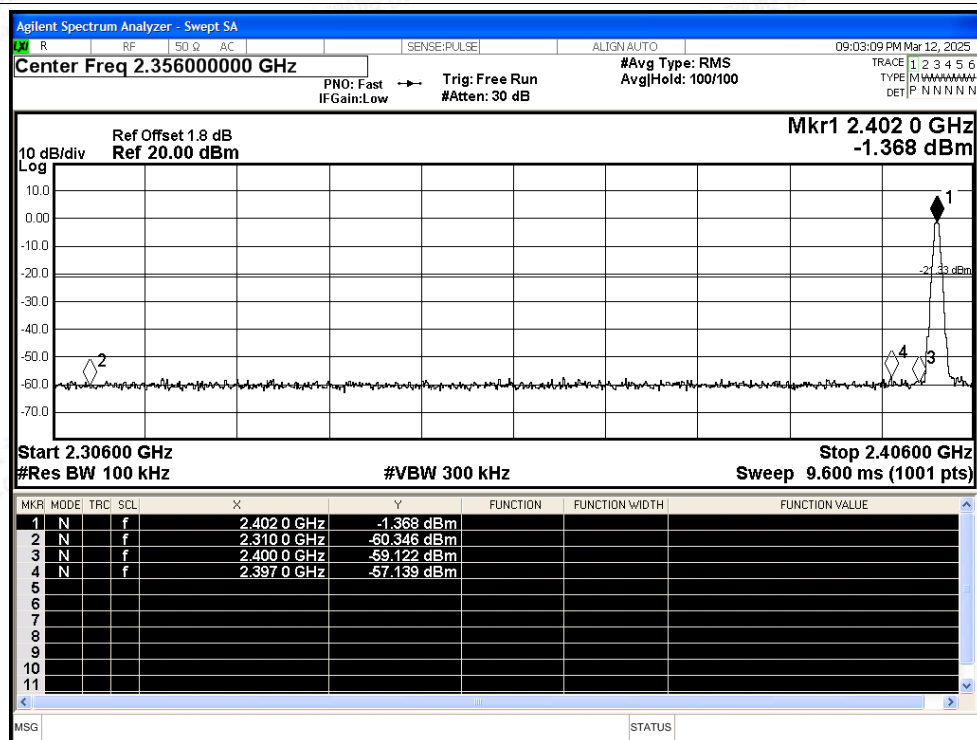


Test Graphs

Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Ref

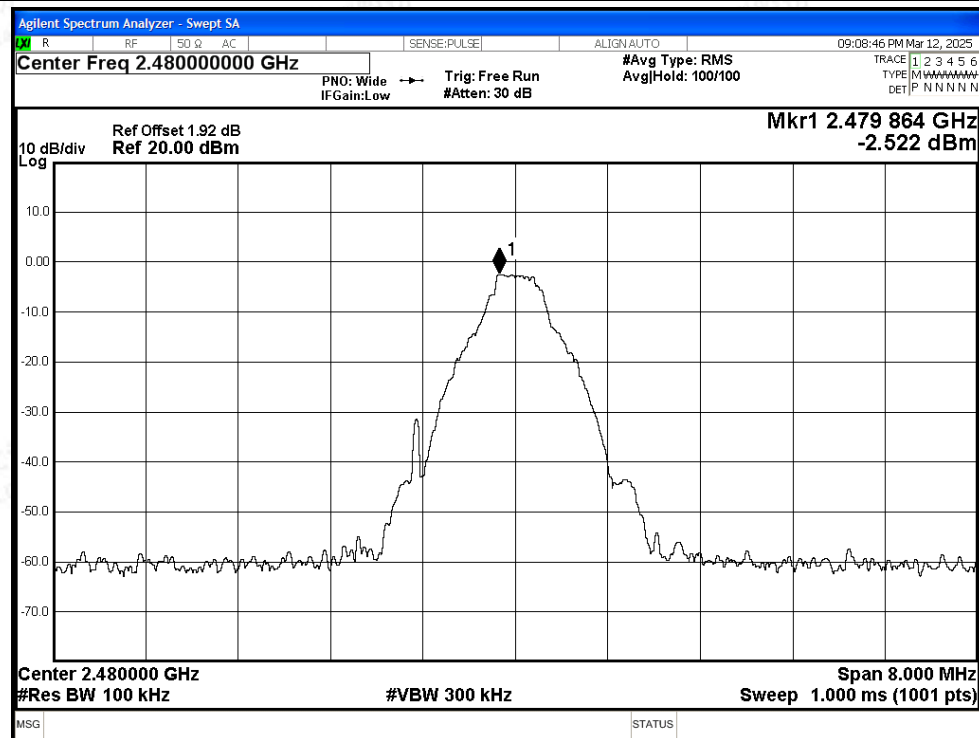


Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Emission

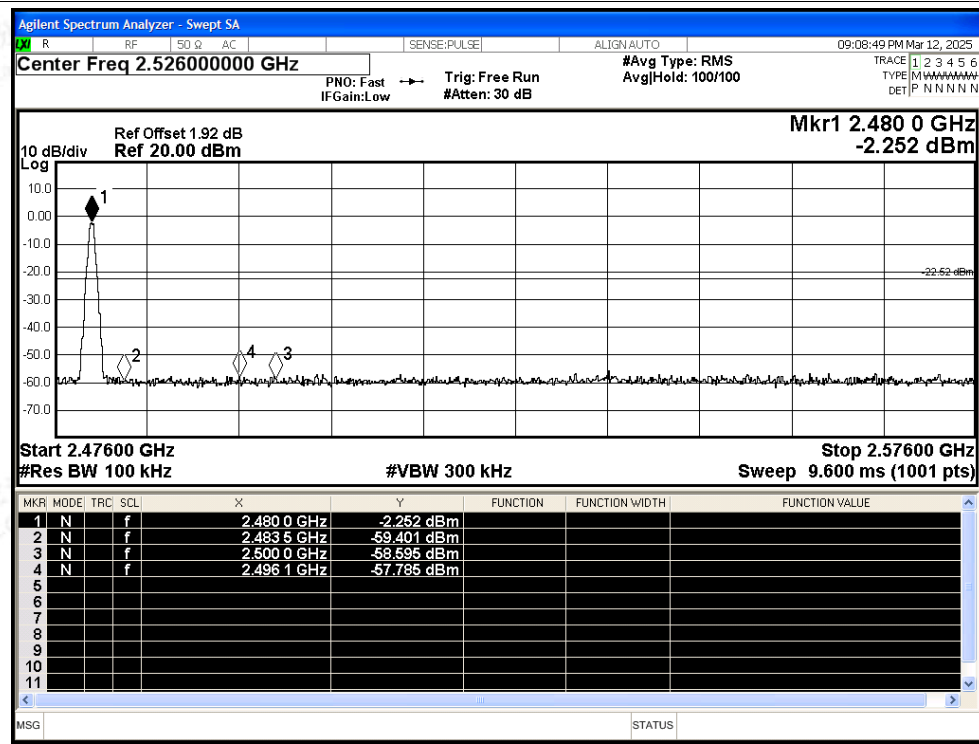




Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Ref

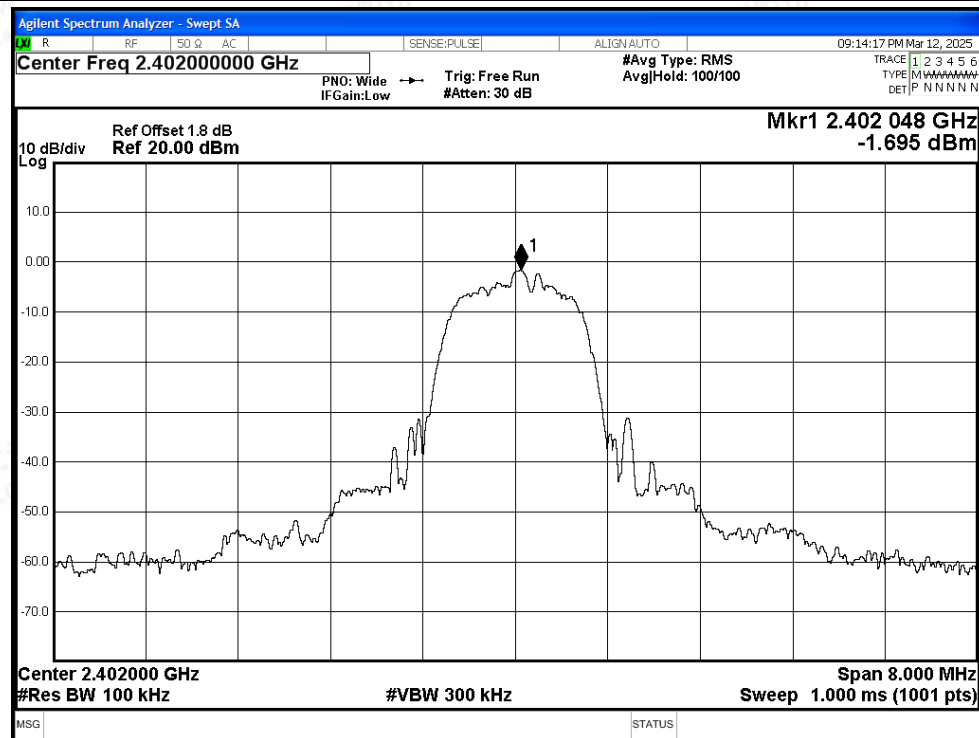


Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Emission

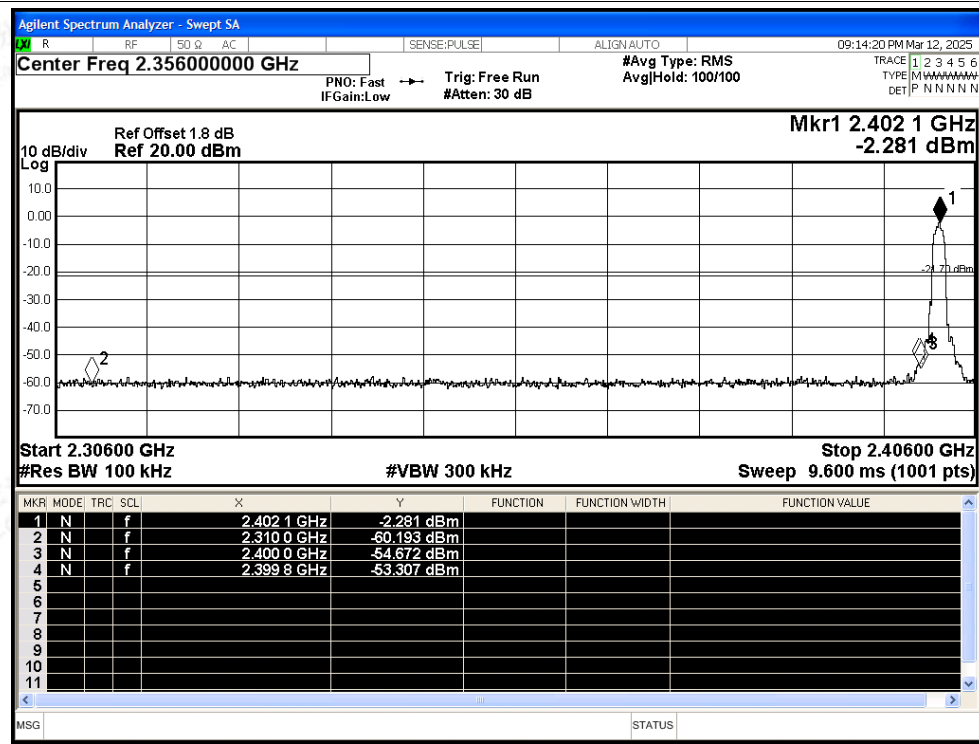




Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Ref

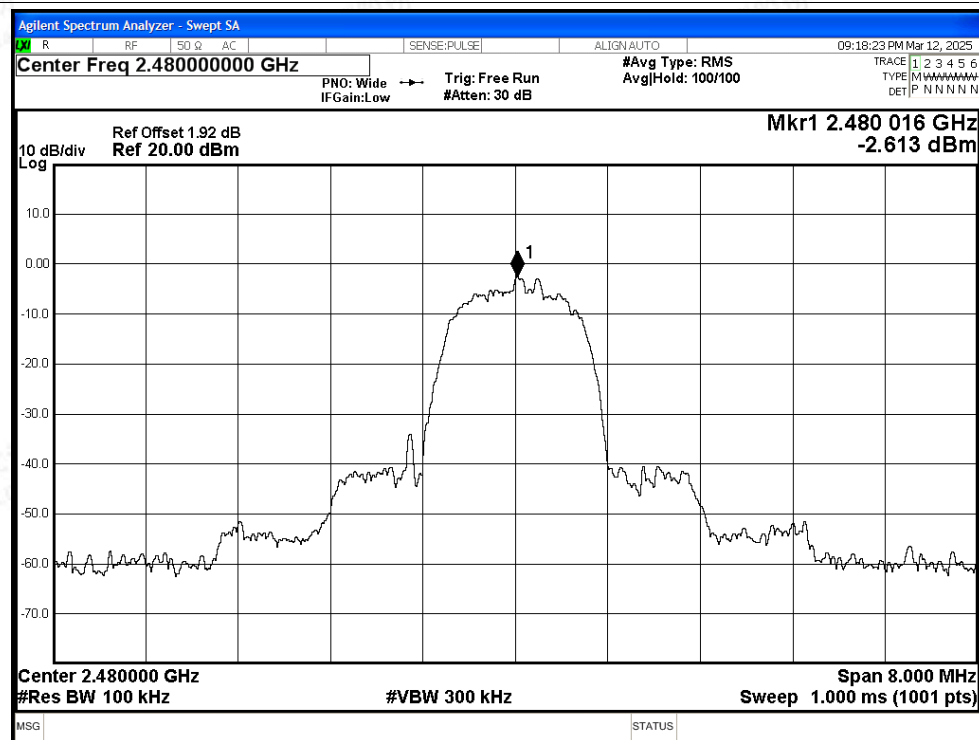


Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Emission

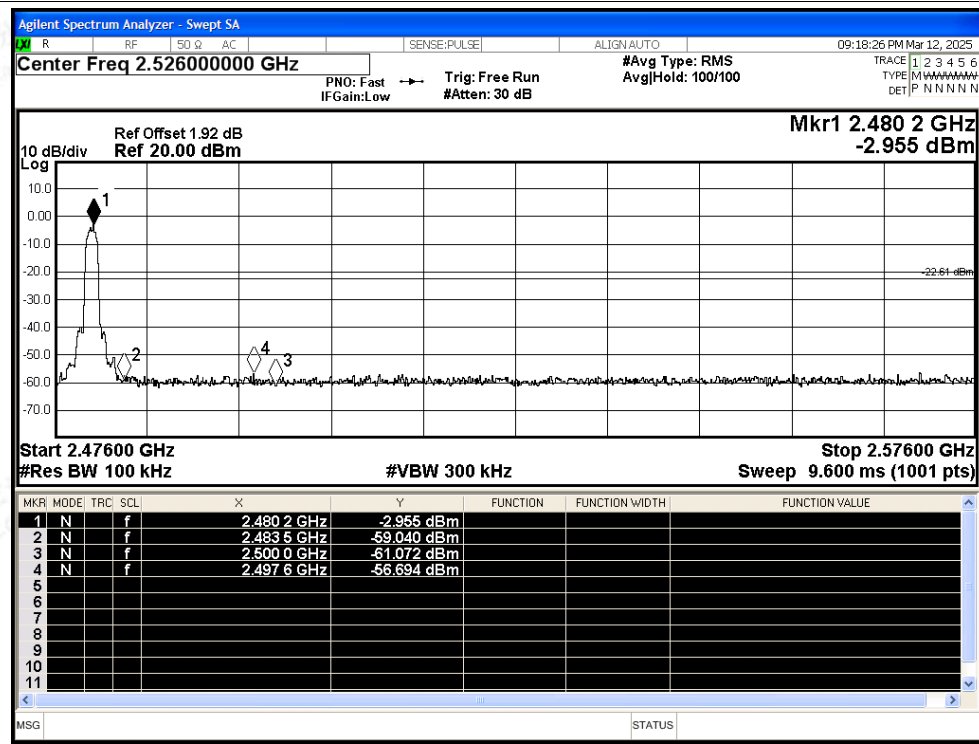




Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Ref

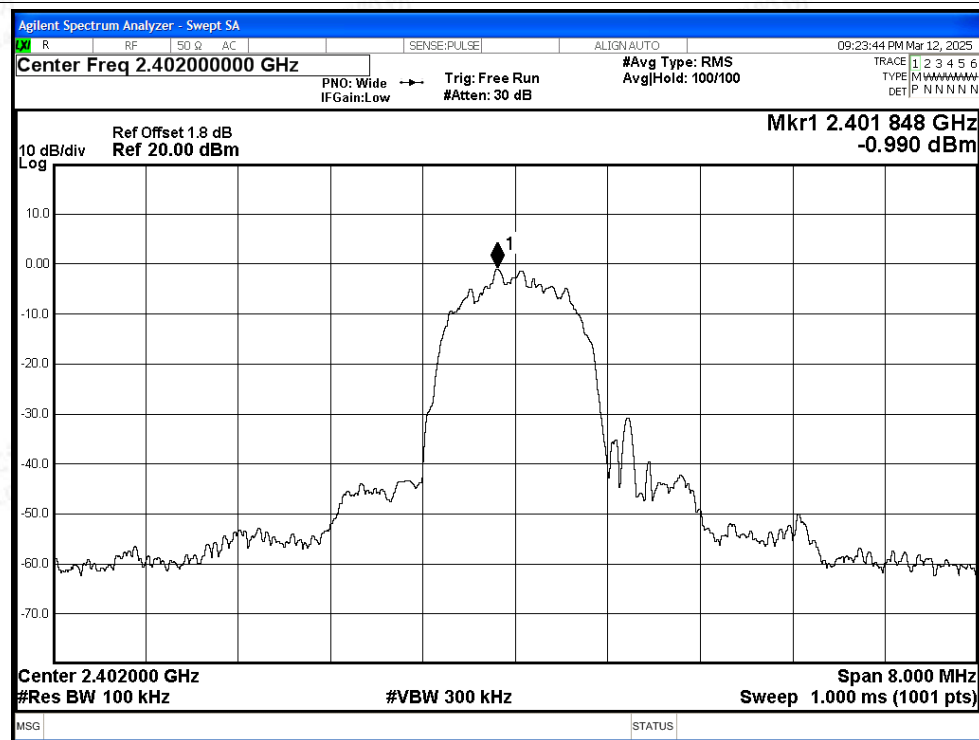


Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Emission

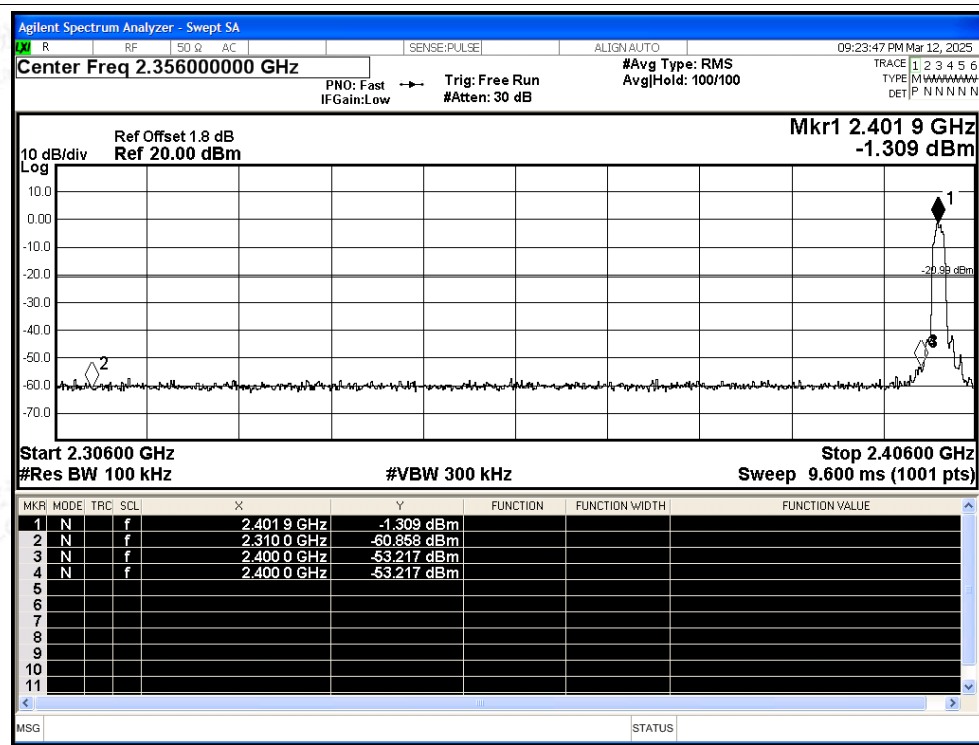




Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Ref

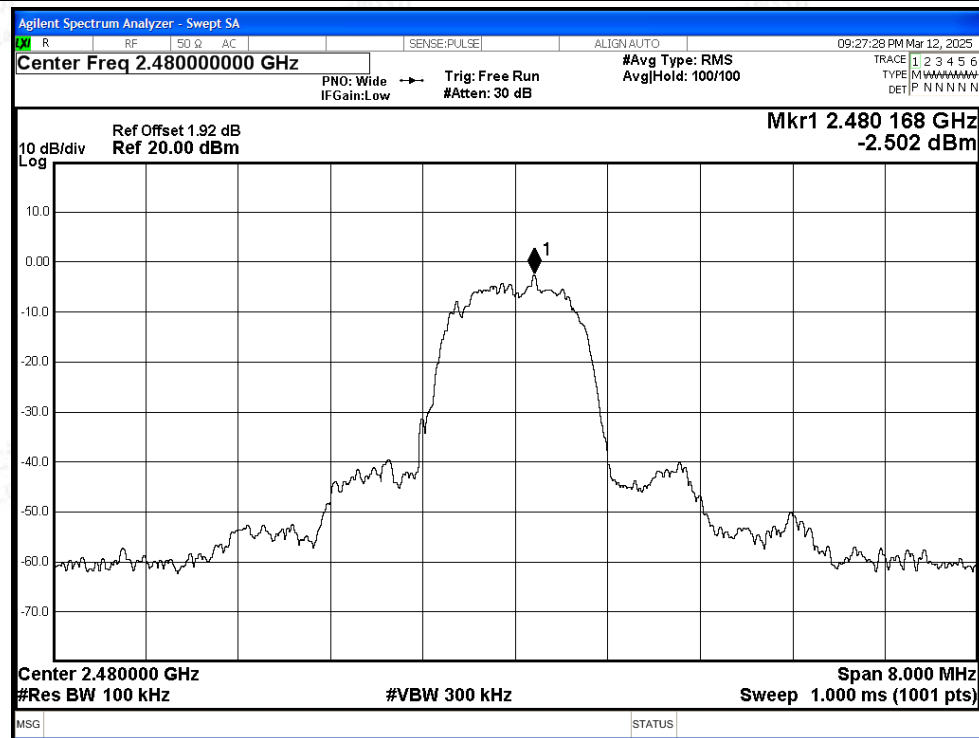


Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Emission

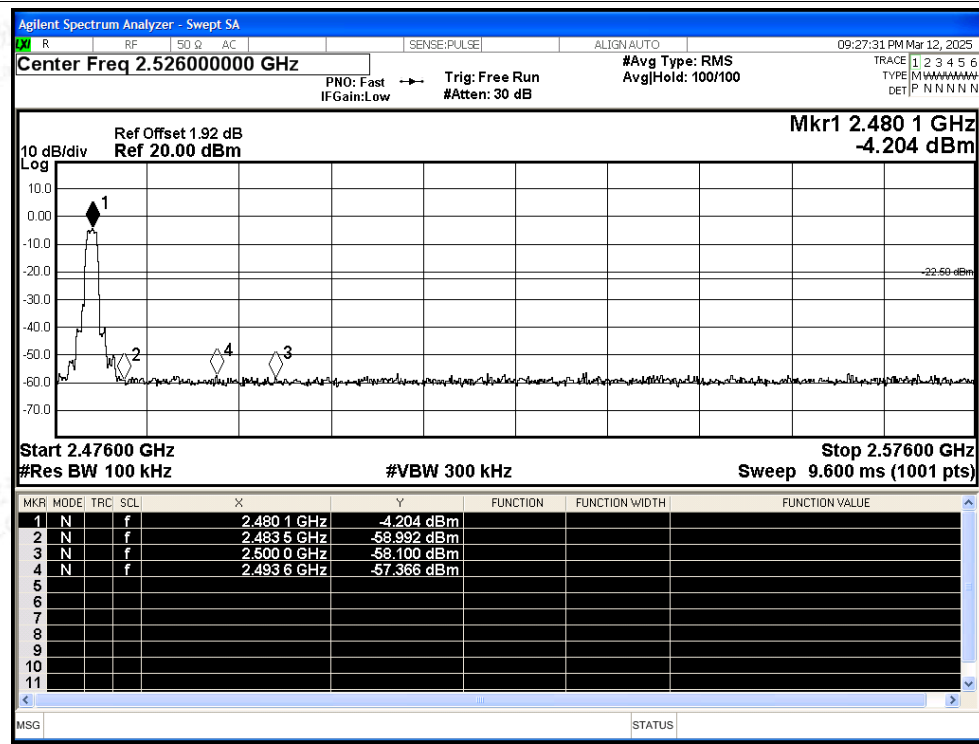




Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Ref



Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Emission



**(Hopping)**

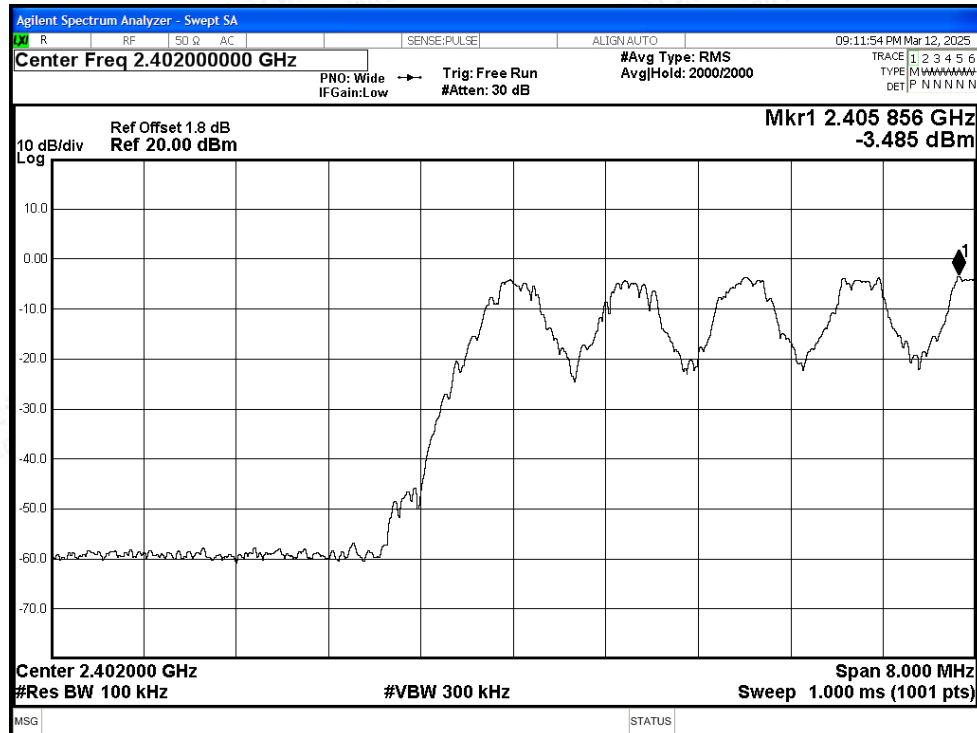
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	Hopping	-52.57	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-54.29	-20	Pass
NVNT	2-DH5	2402	Ant1	Hopping	-53.05	-20	Pass
NVNT	2-DH5	2480	Ant1	Hopping	-53.03	-20	Pass
NVNT	3-DH5	2402	Ant1	Hopping	-51.75	-20	Pass
NVNT	3-DH5	2480	Ant1	Hopping	-54.53	-20	Pass



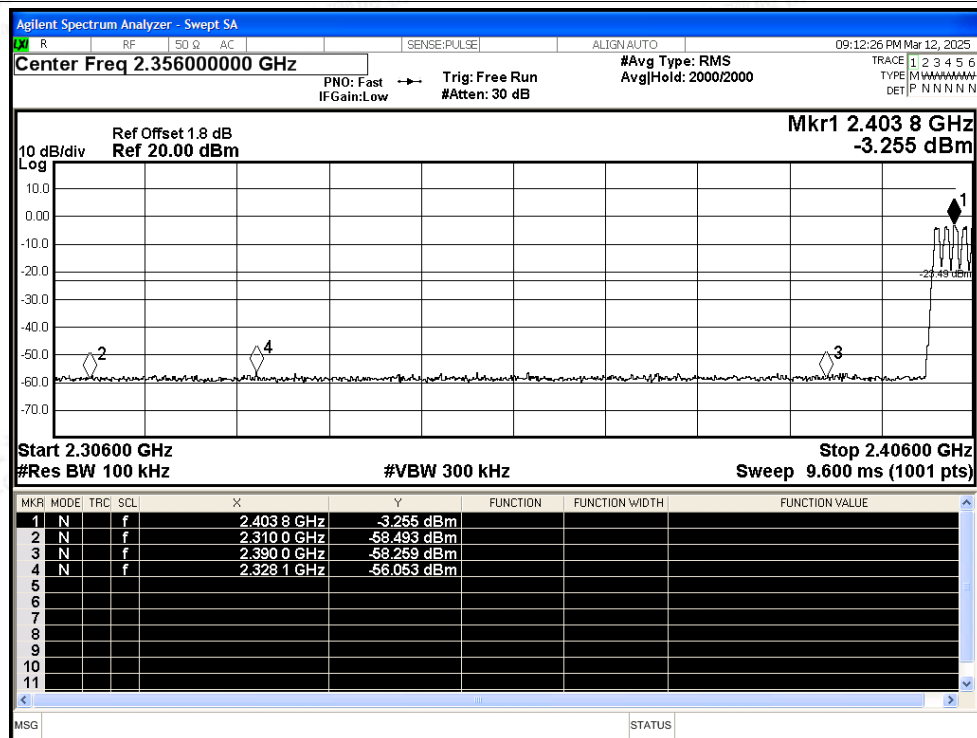


Test Graphs

Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission



Shenzhen LCS Compliance Testing Laboratory Ltd.

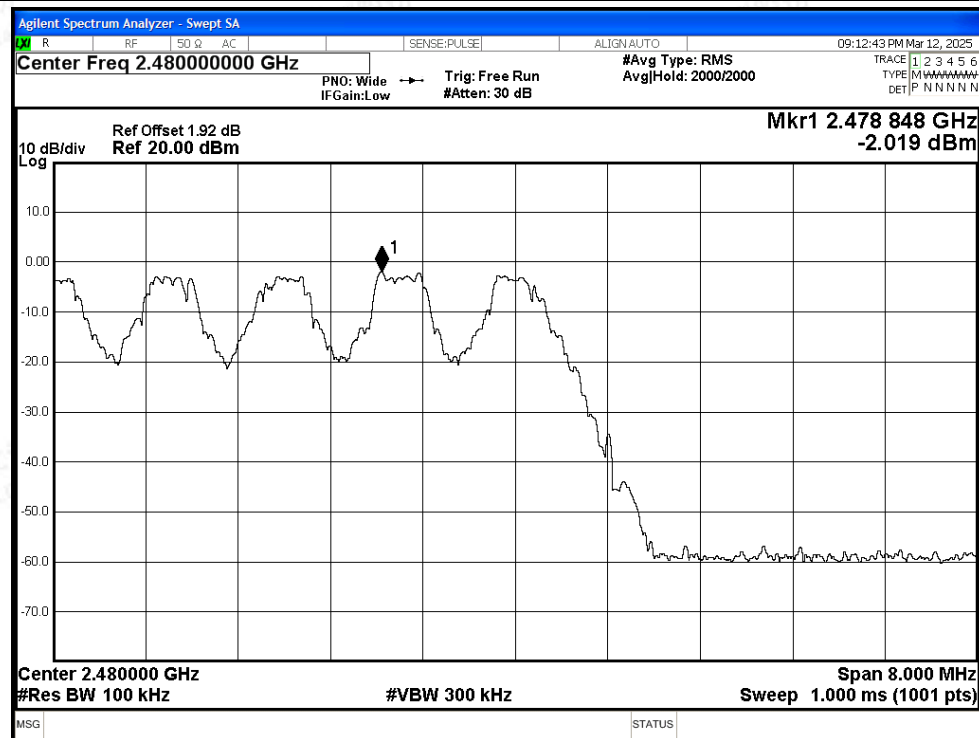
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

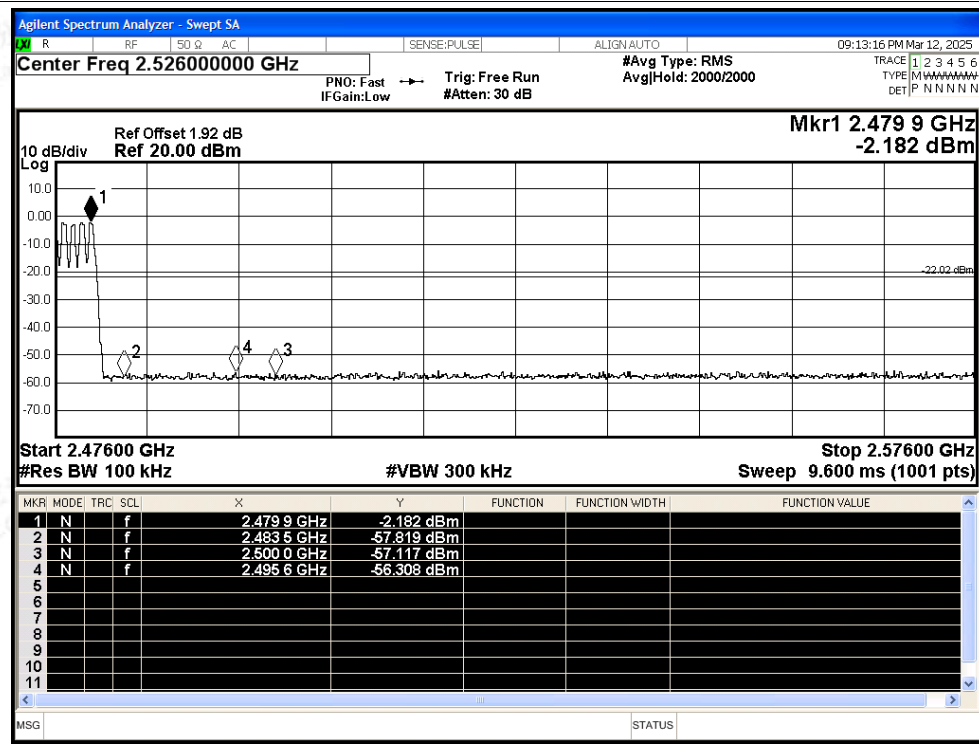
Scan code to check authenticity



Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Ref

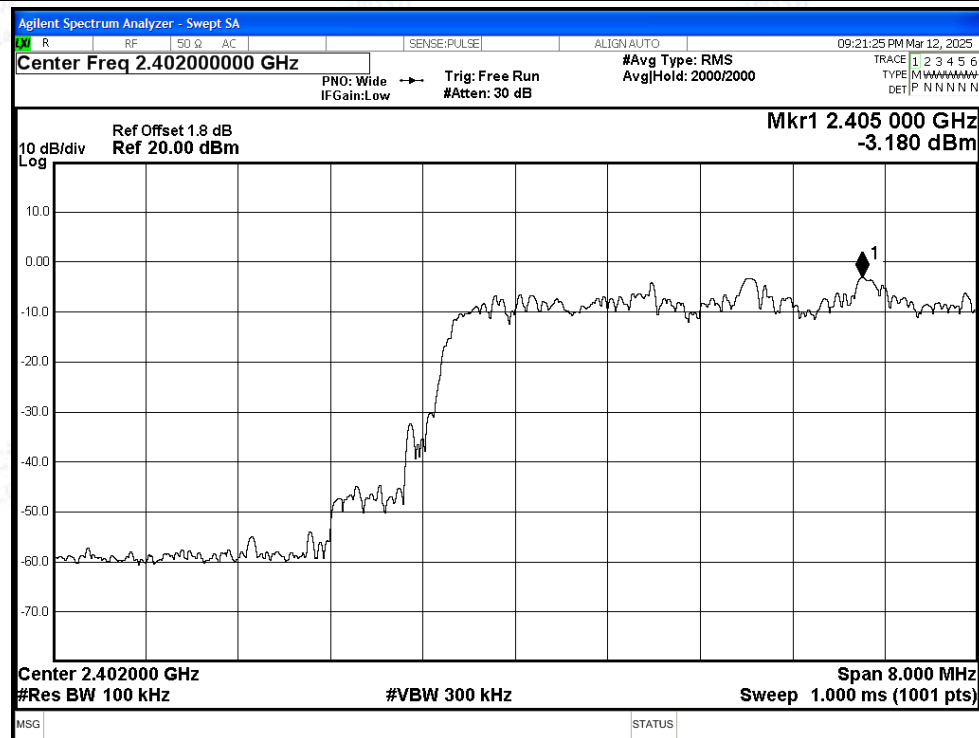


Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Emission

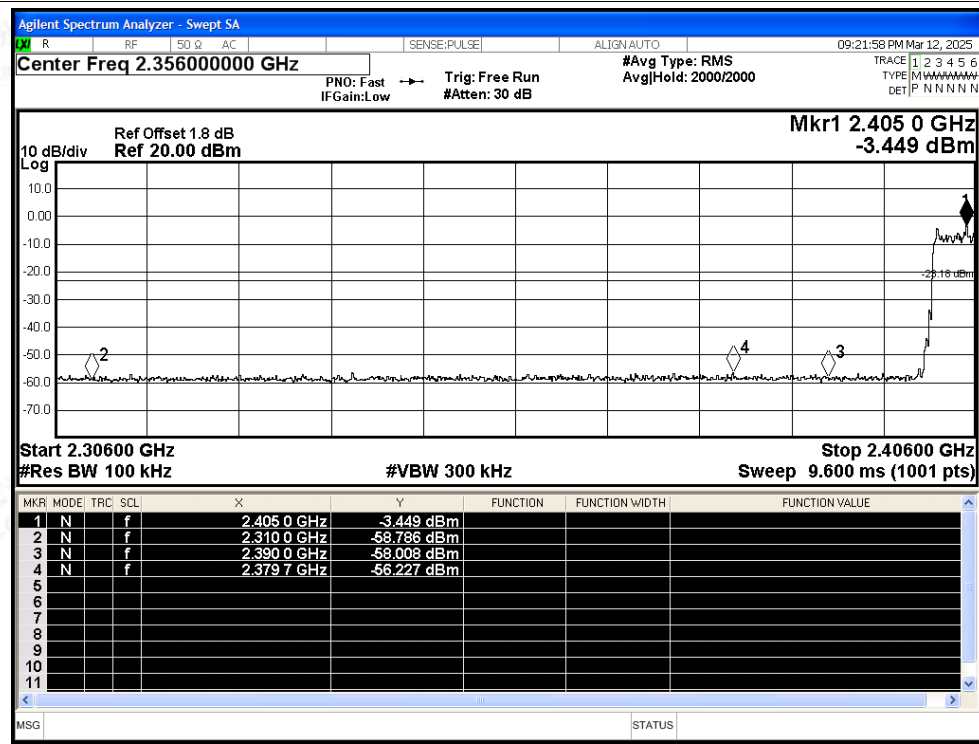




Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Emission

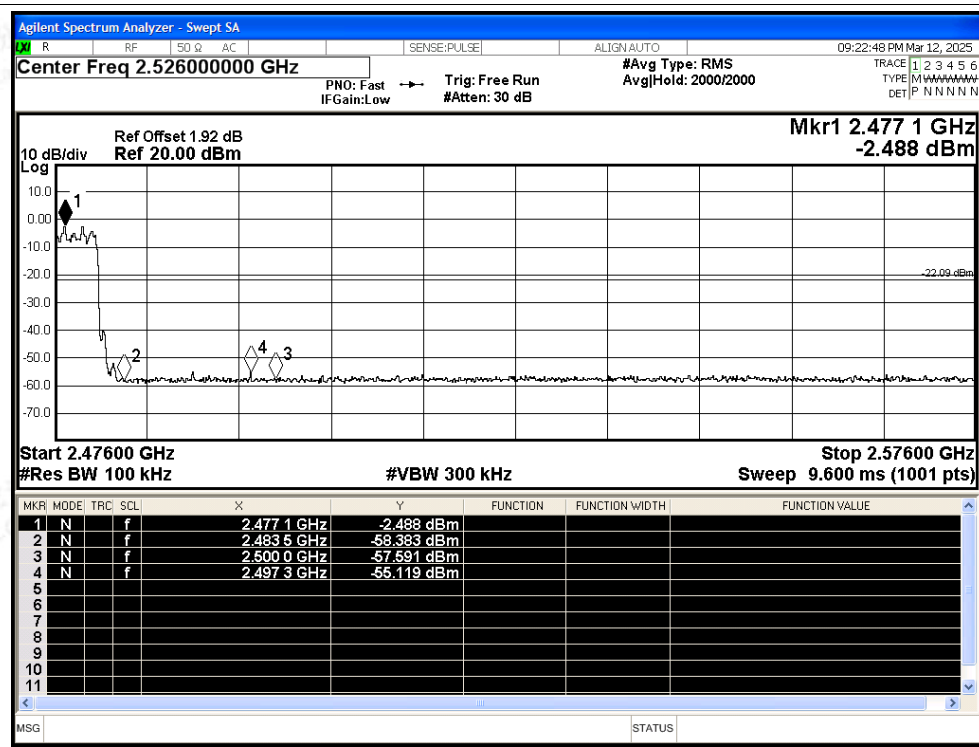




Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Ref

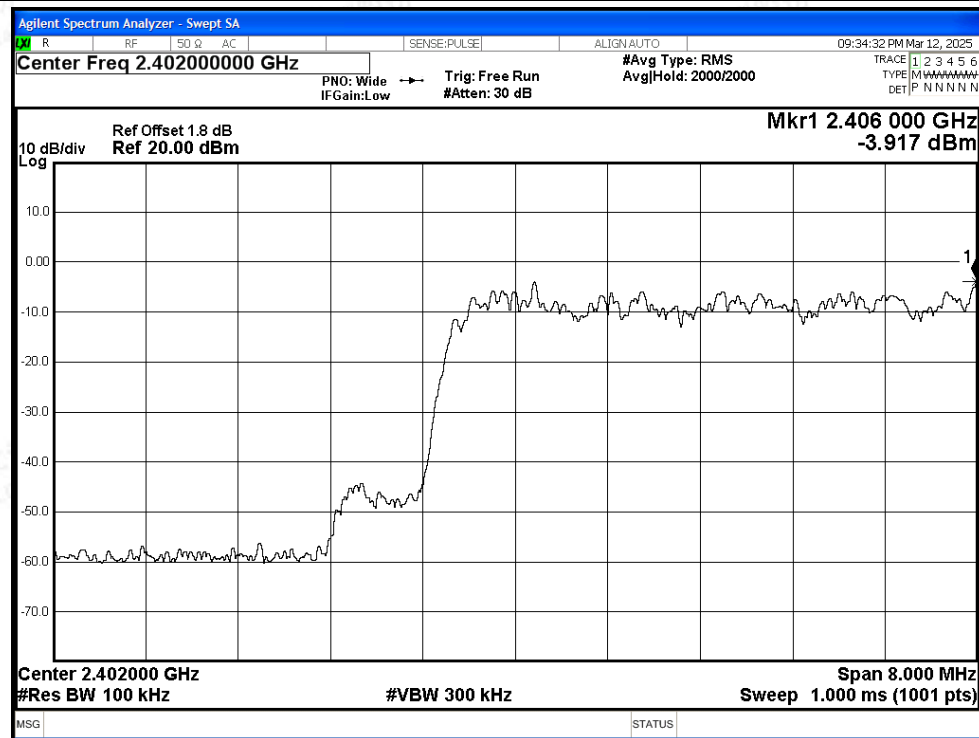


Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Emission

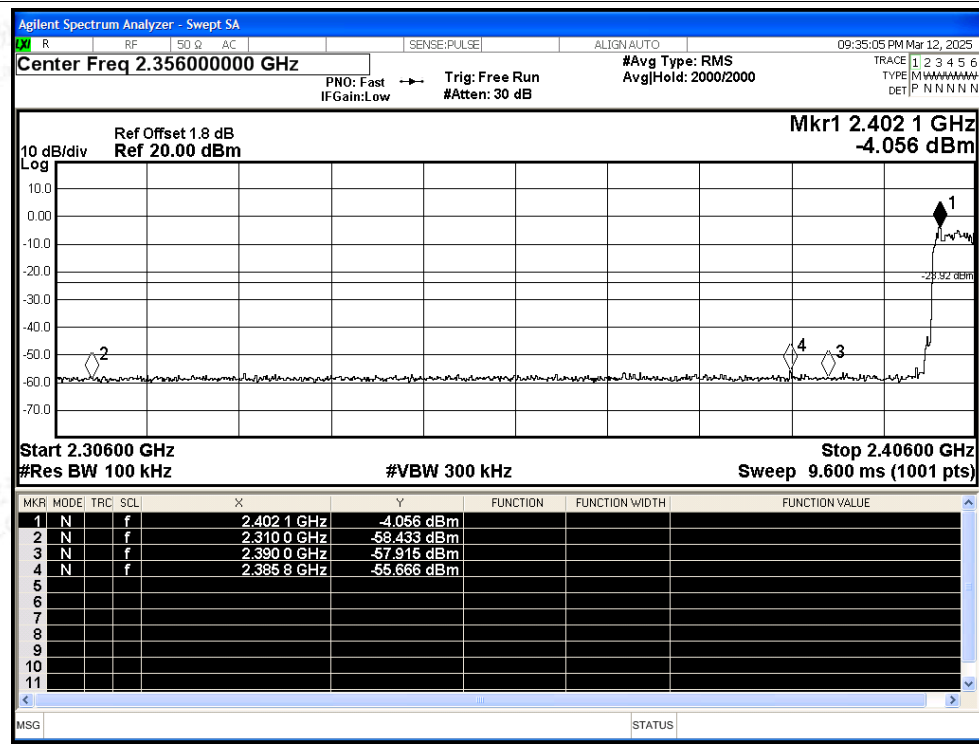




Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Emission



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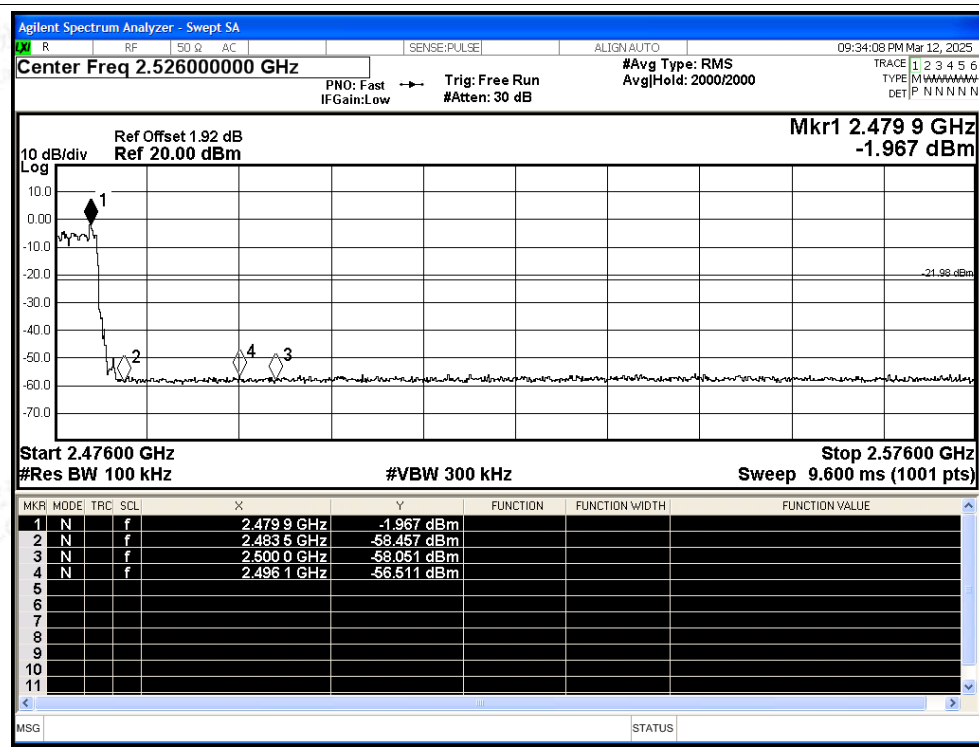
Scan code to check authenticity



Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Emission





A.7 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	-54.25	-20	Pass
NVNT	1-DH5	2441	Ant1	-54.22	-20	Pass
NVNT	1-DH5	2480	Ant1	-52.85	-20	Pass
NVNT	2-DH5	2402	Ant1	-53.71	-20	Pass
NVNT	2-DH5	2441	Ant1	-50.14	-20	Pass
NVNT	2-DH5	2480	Ant1	-53.04	-20	Pass
NVNT	3-DH5	2402	Ant1	-54.4	-20	Pass
NVNT	3-DH5	2441	Ant1	-52.84	-20	Pass
NVNT	3-DH5	2480	Ant1	-53.52	-20	Pass

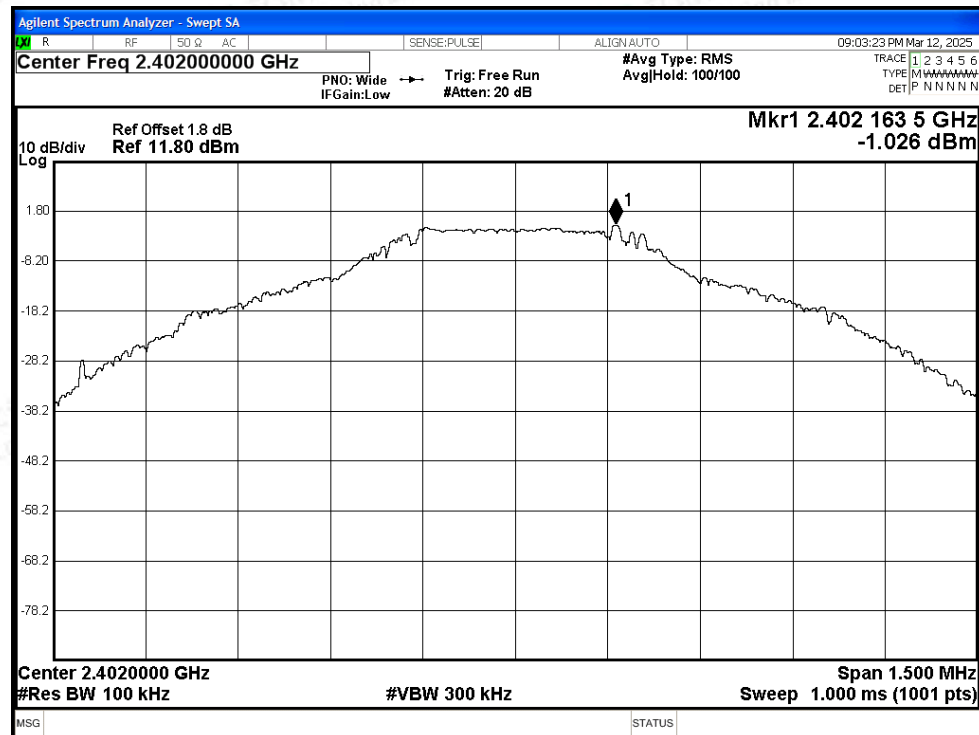


Shenzhen LCS Compliance Testing Laboratory Ltd.
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com
Scan code to check authenticity

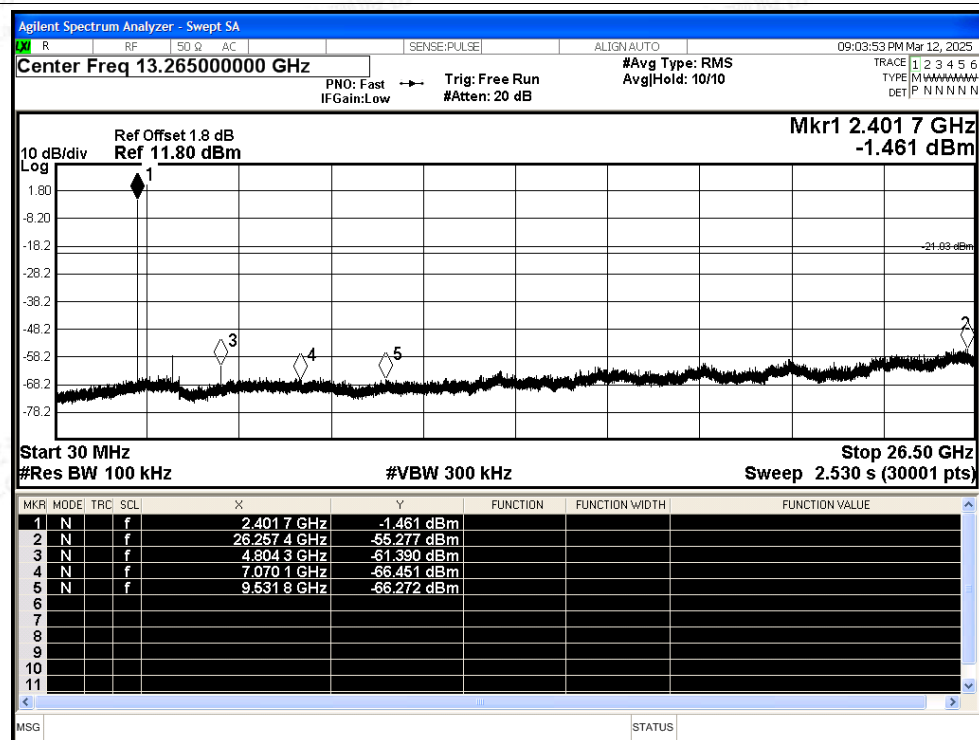


Test Graphs

Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Ref

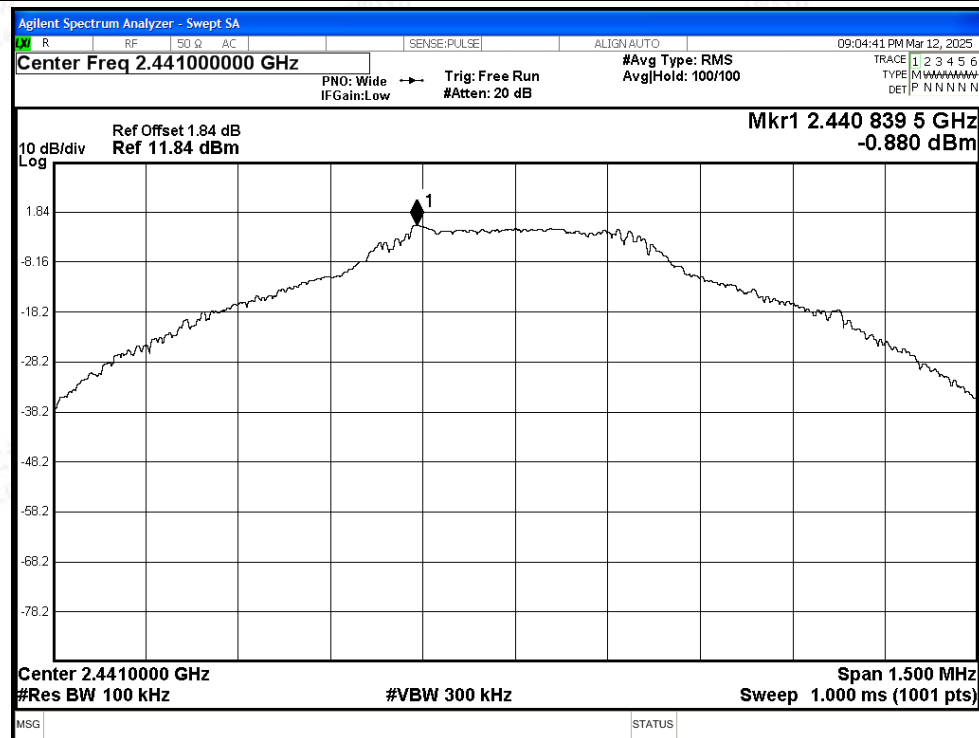


Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Emission

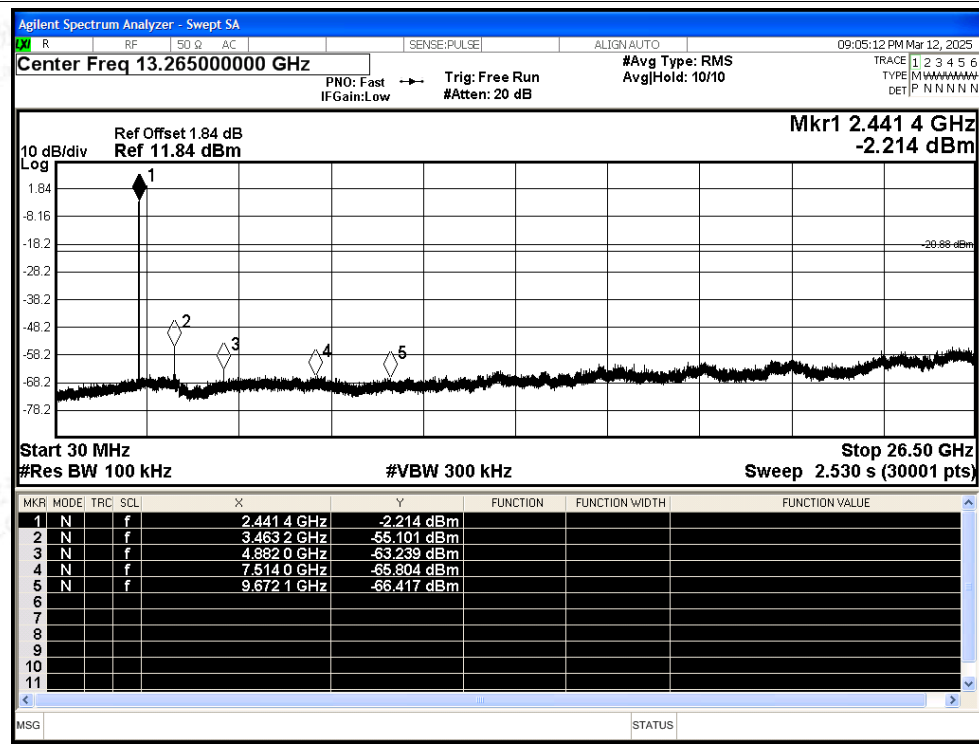




Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Ref

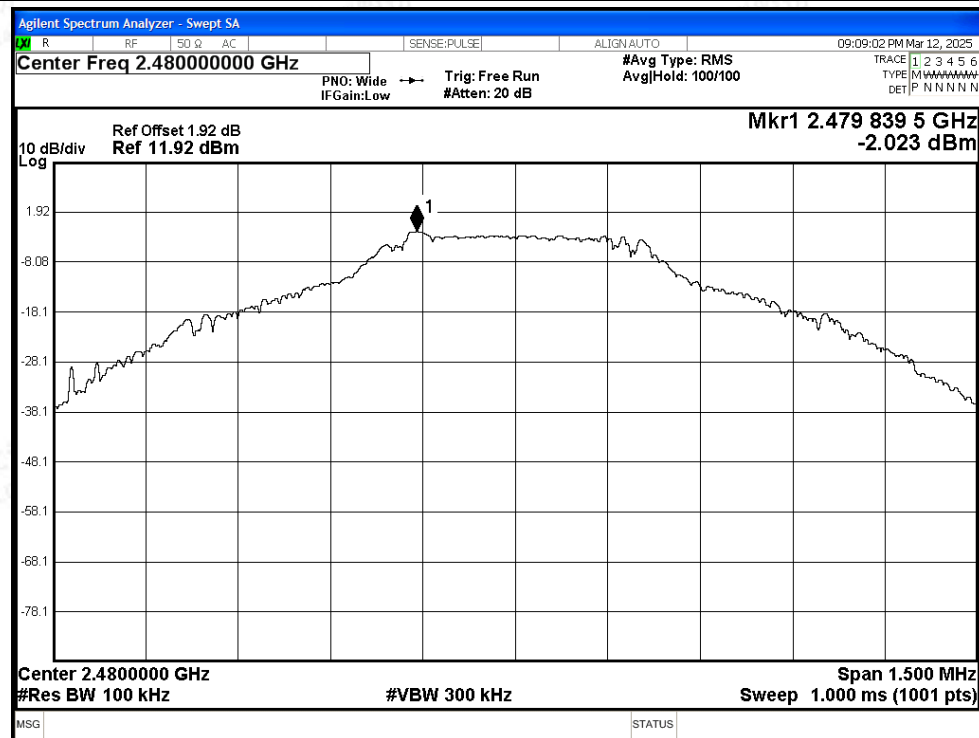


Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Emission

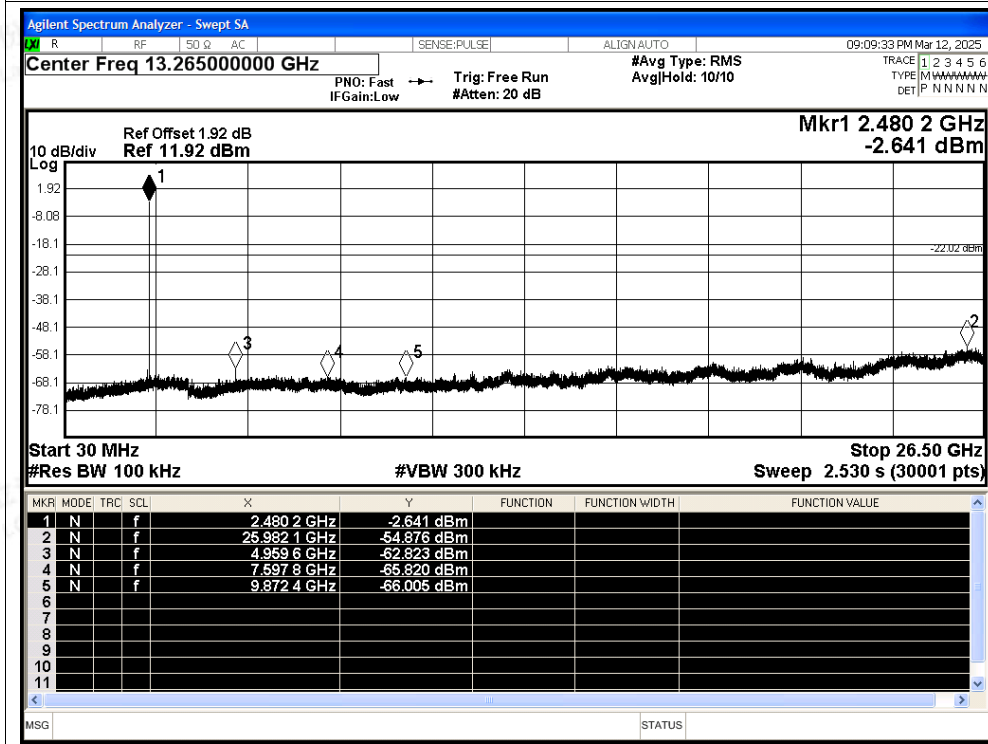




Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Ref

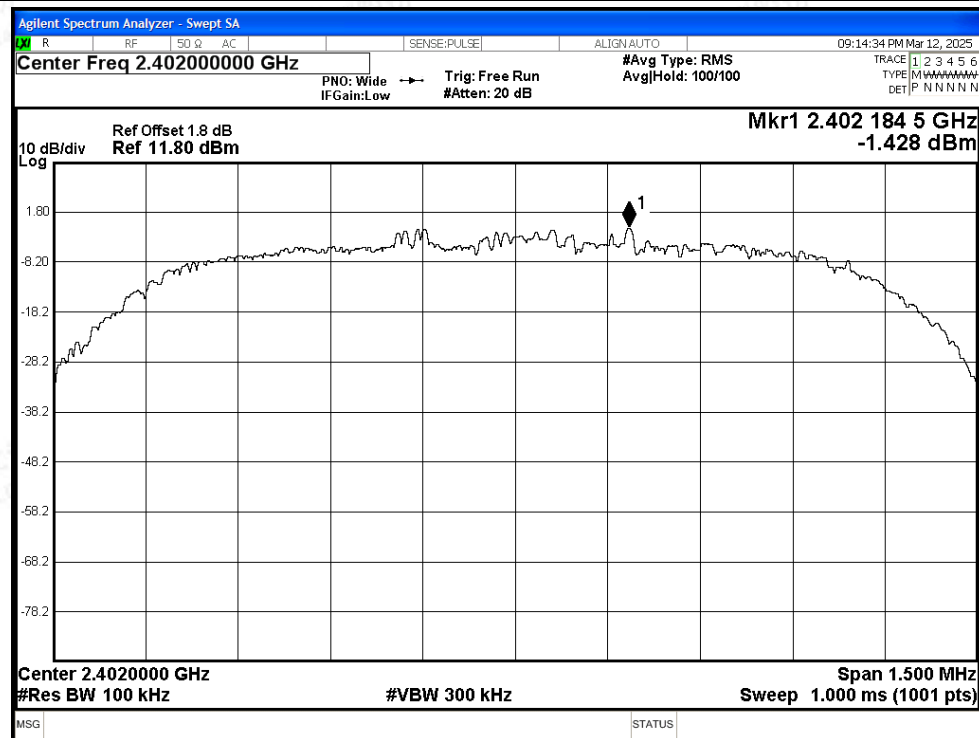


Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Emission

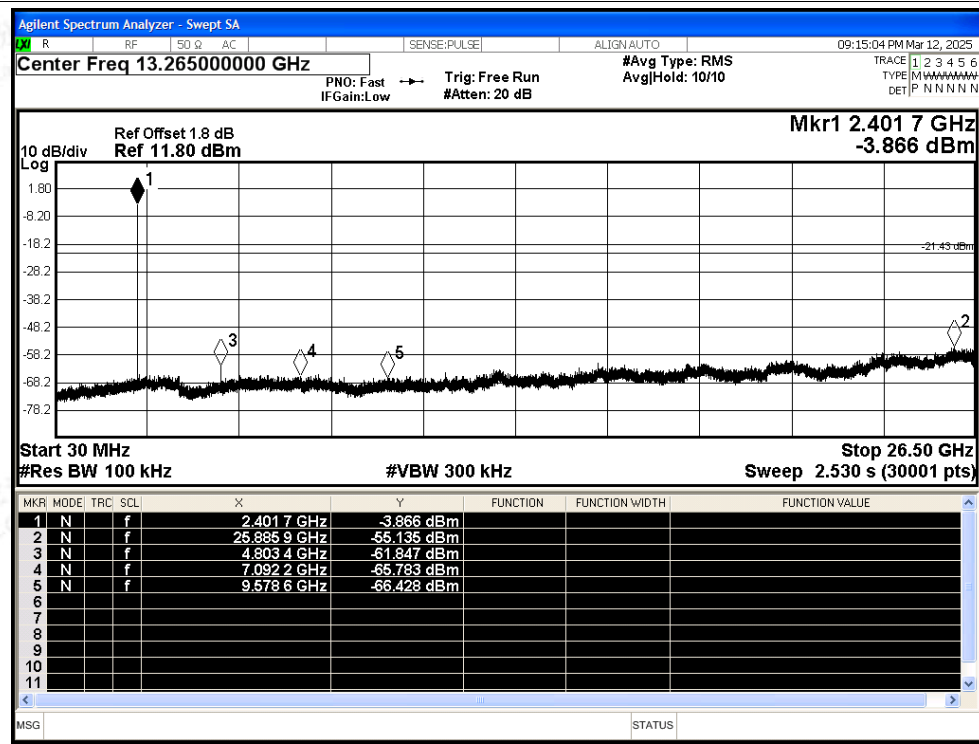




Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Ref

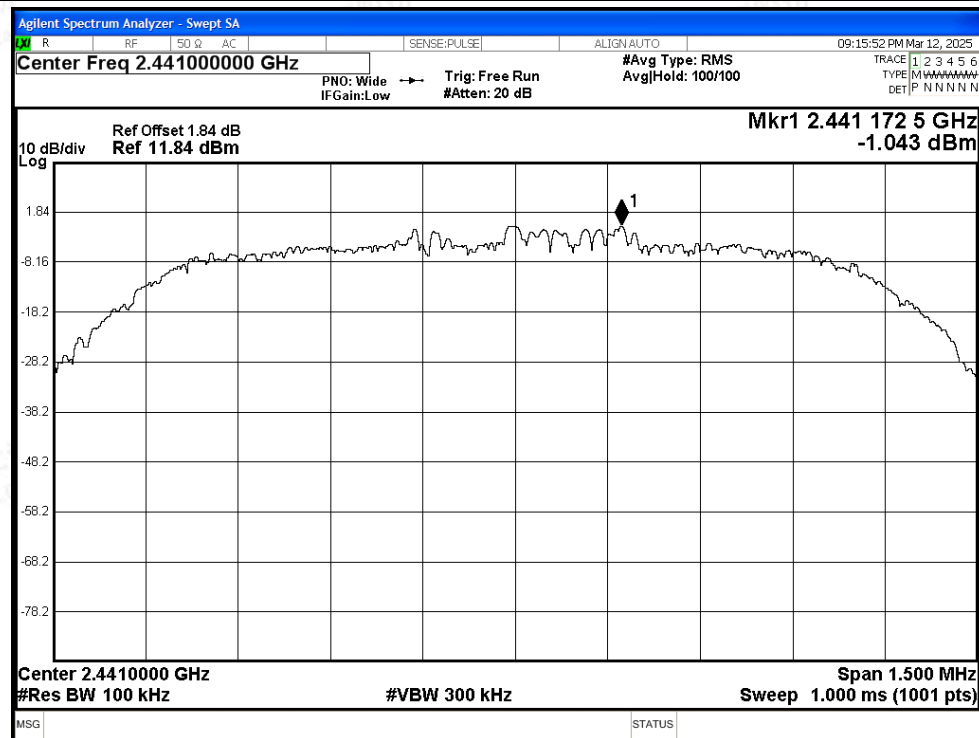


Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Emission

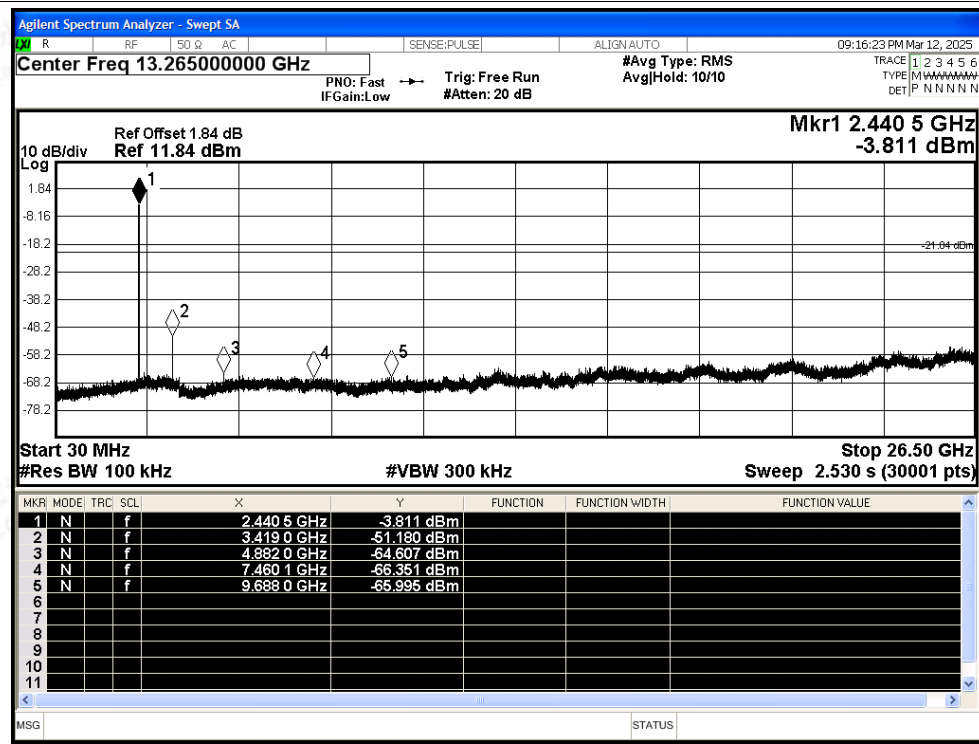




Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Ref

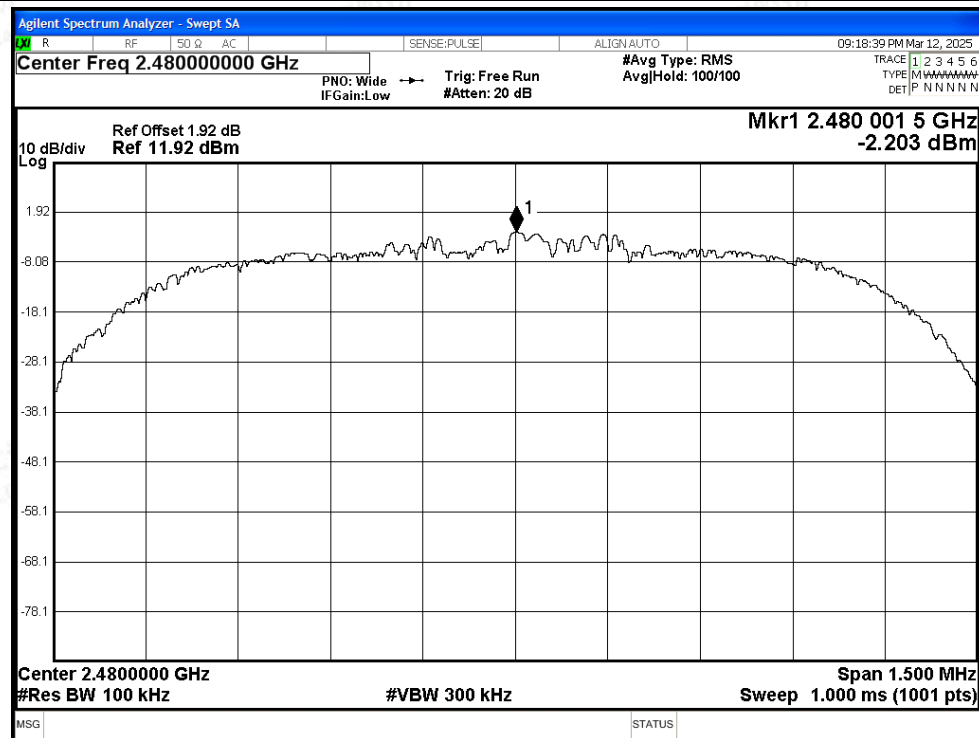


Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Emission

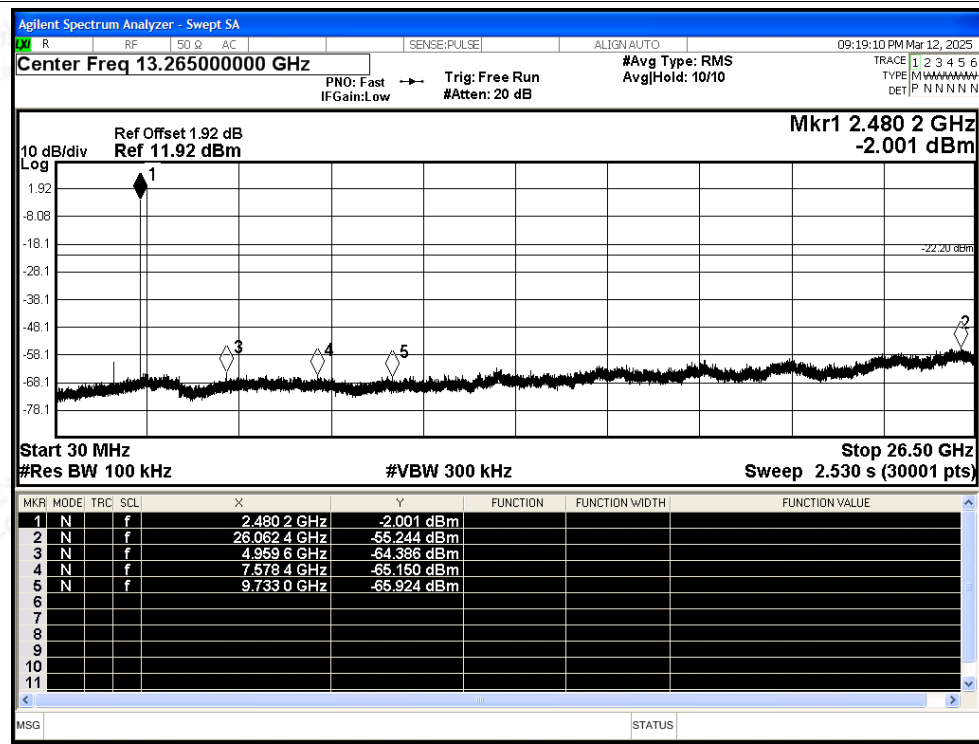




Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Ref

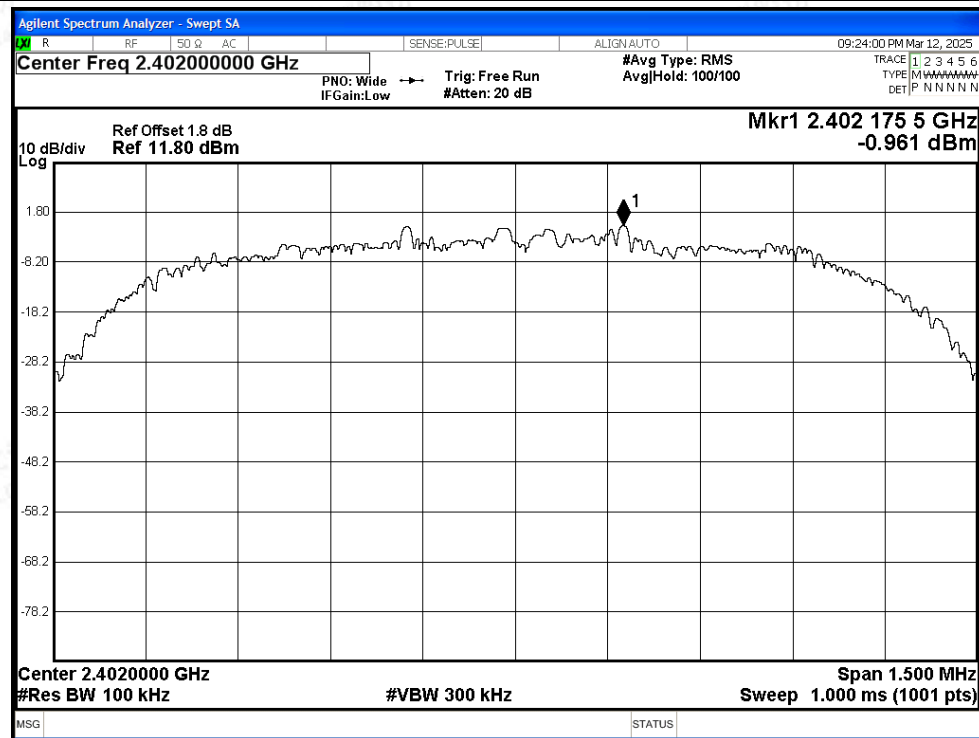


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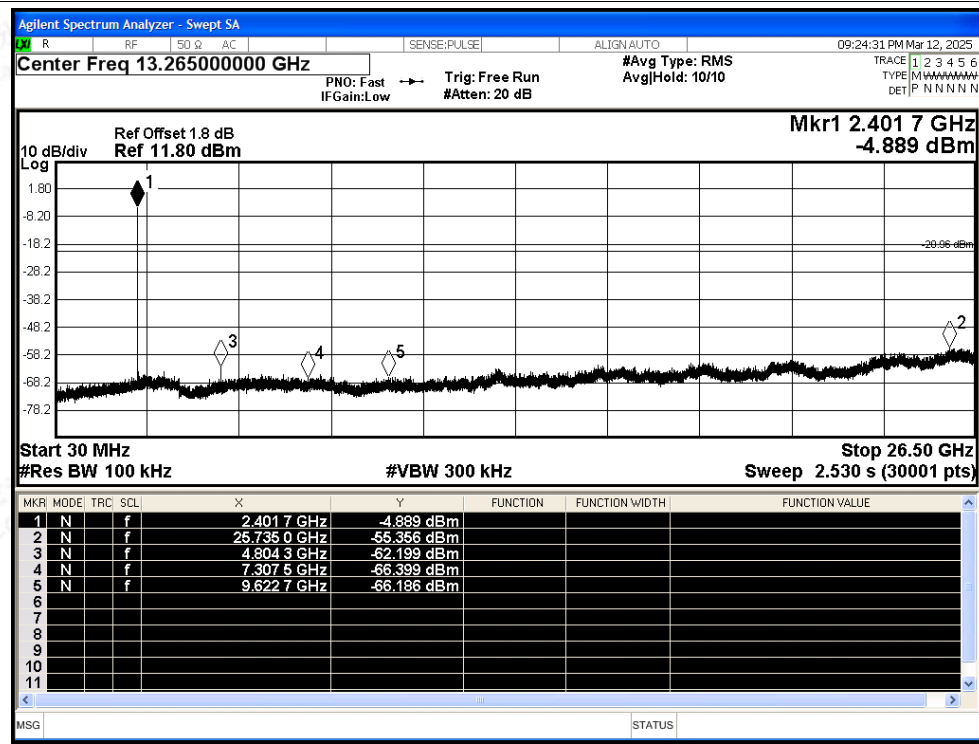




Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Ref

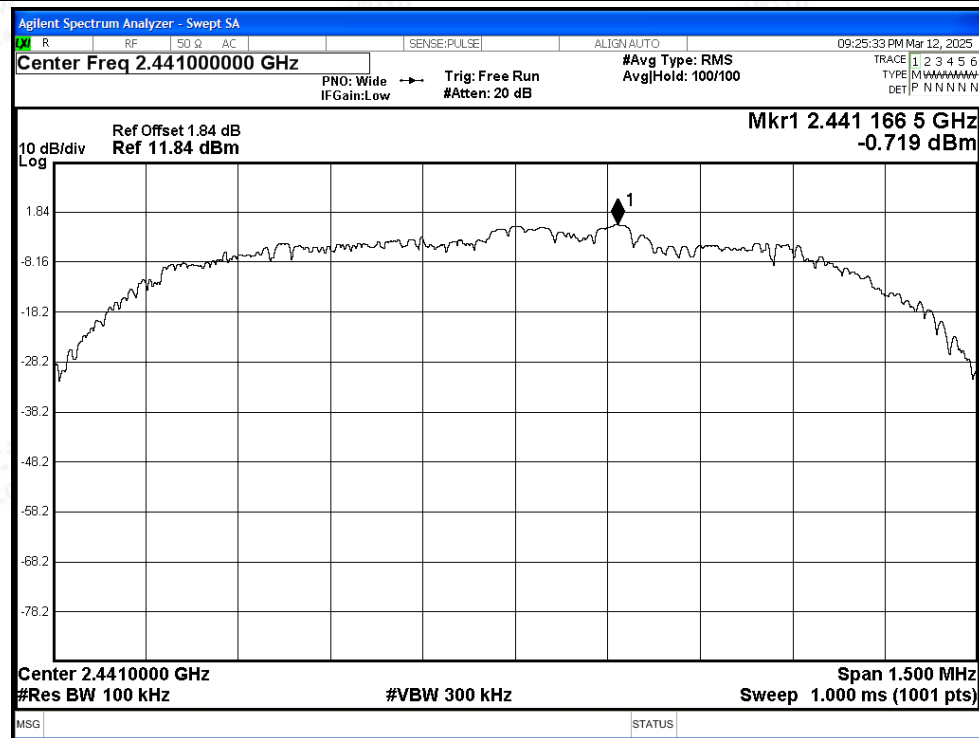


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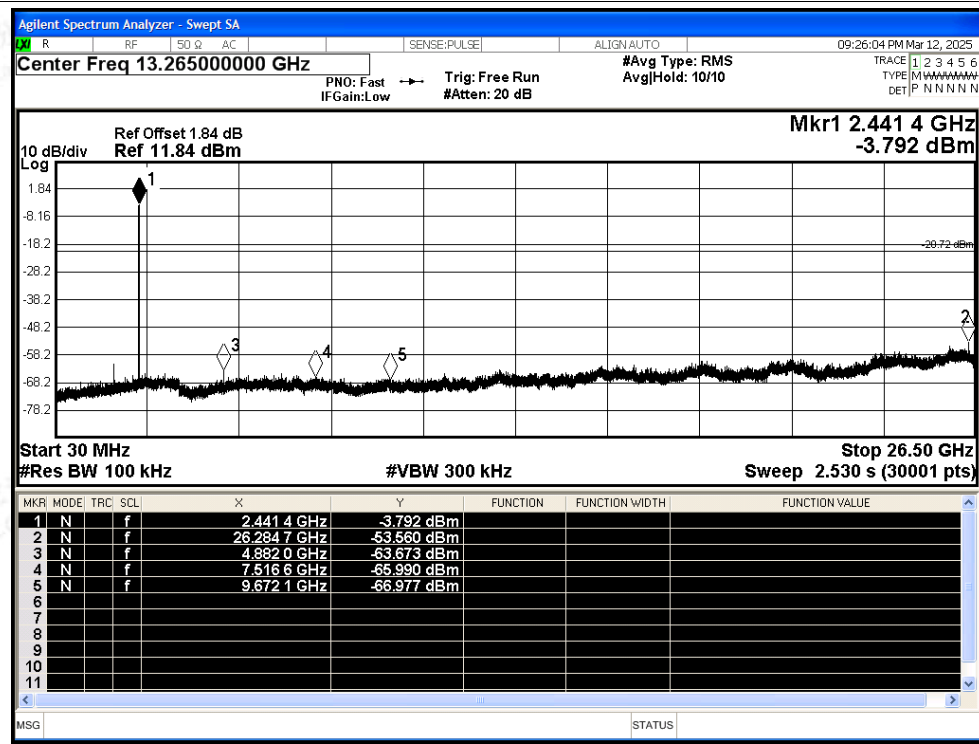




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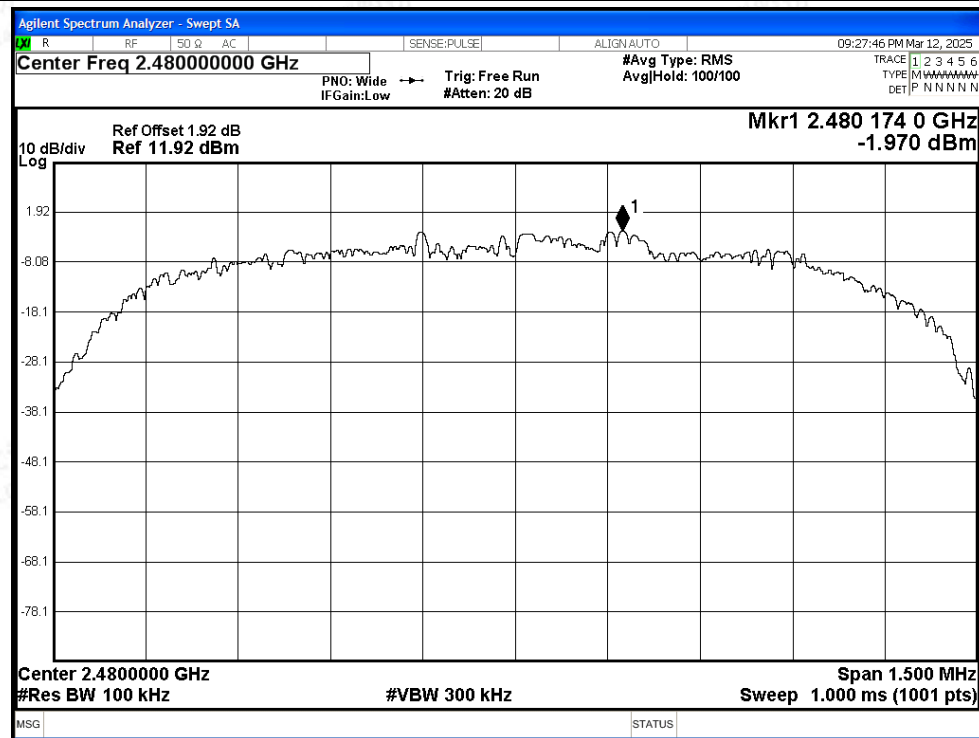


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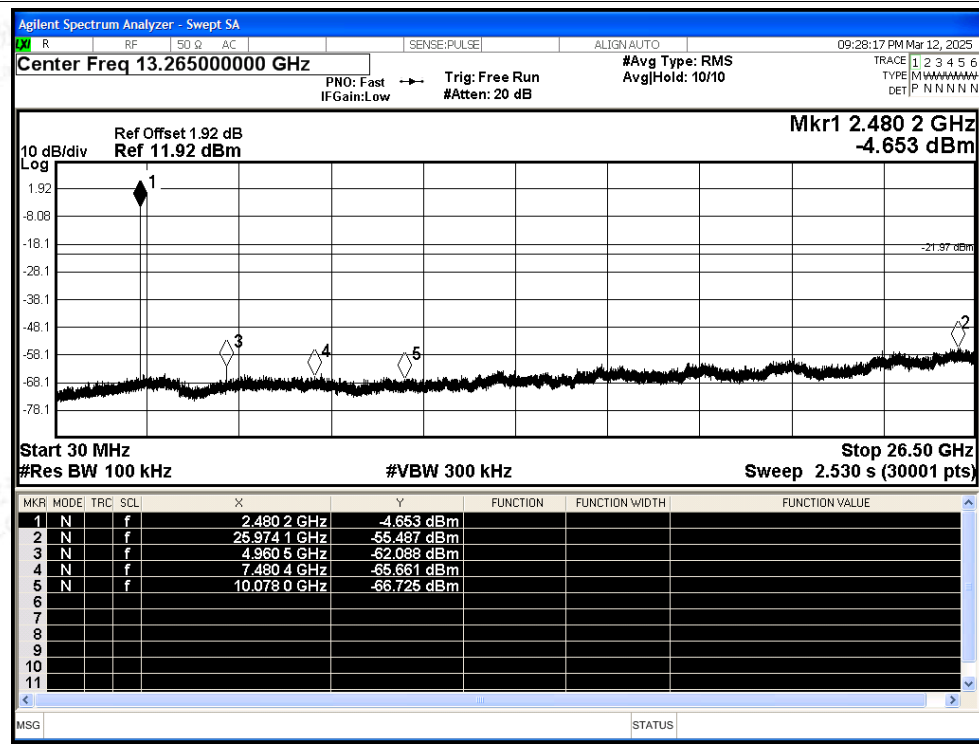




Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Emission





A.8 Duty Cycle

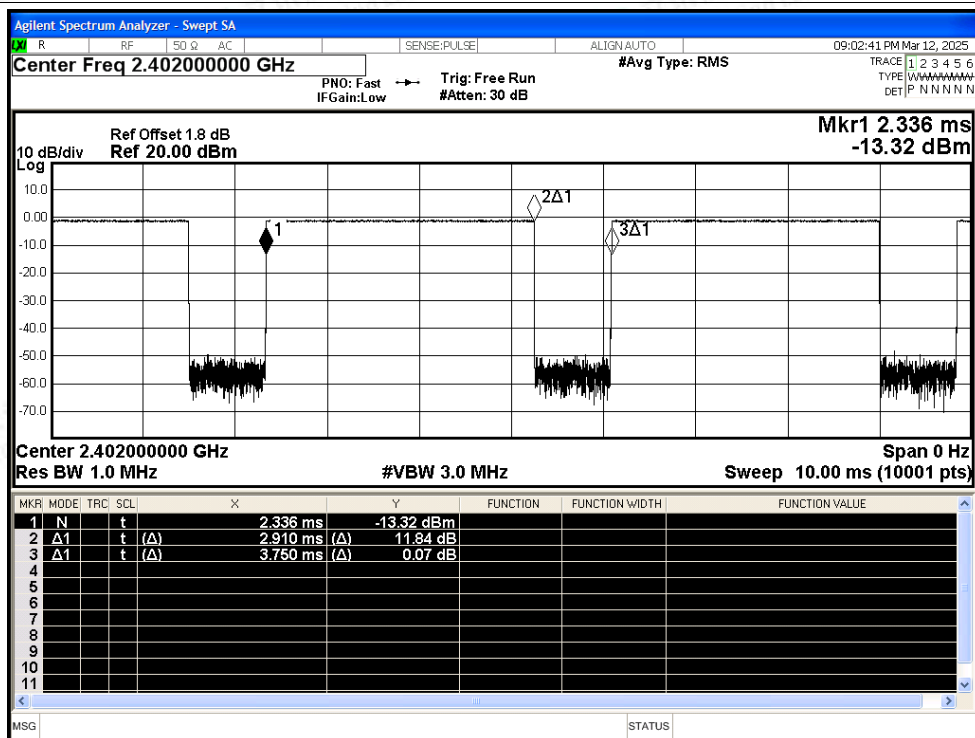
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH5	2402	Ant1	77.6	1.1	0.34
NVNT	1-DH5	2441	Ant1	77.6	1.1	0.34
NVNT	1-DH5	2480	Ant1	77.6	1.1	0.34
NVNT	2-DH5	2402	Ant1	77.33	1.12	0.34
NVNT	2-DH5	2441	Ant1	77.33	1.12	0.34
NVNT	2-DH5	2480	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2402	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2441	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2480	Ant1	77.28	1.12	0.35



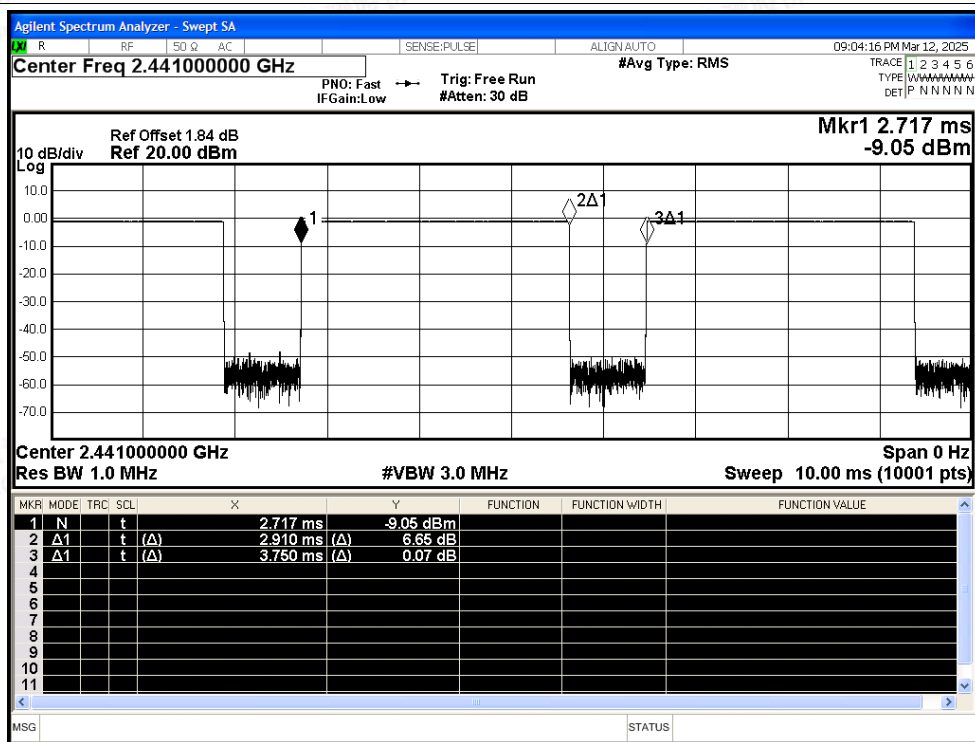


Test Graphs

Duty Cycle NVNT 1-DH5 2402MHz Ant1



Duty Cycle NVNT 1-DH5 2441MHz Ant1



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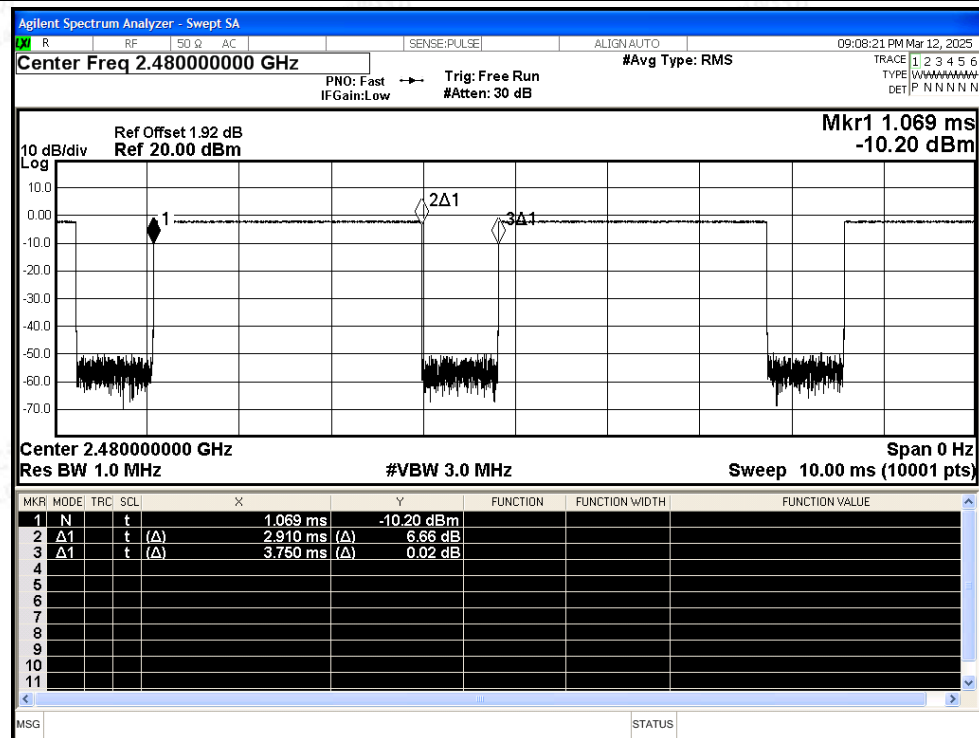
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

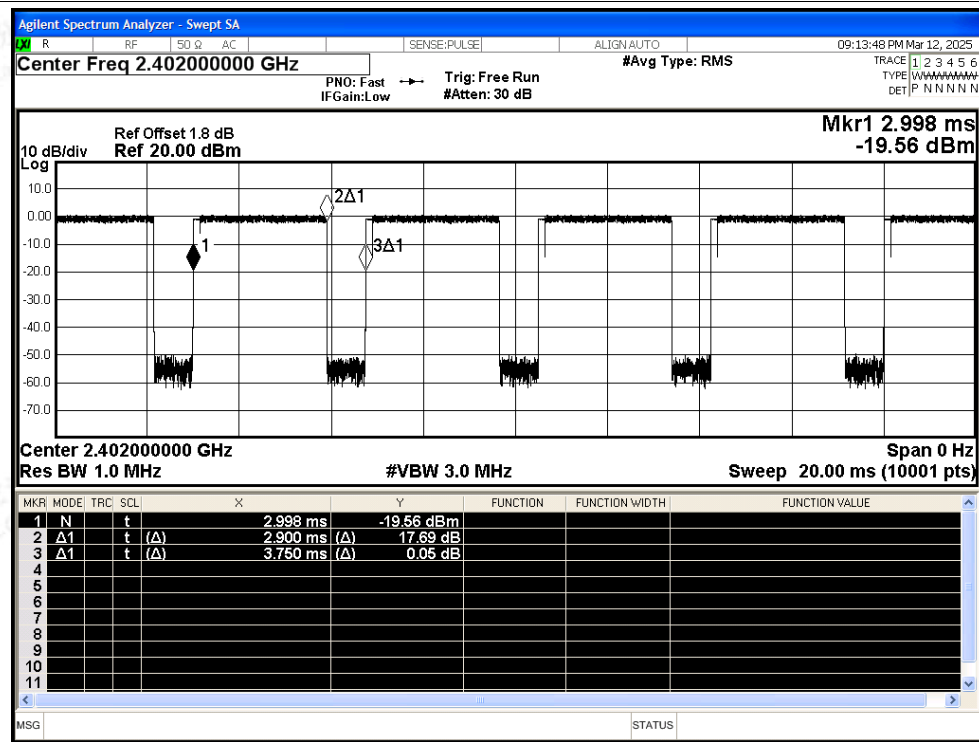
Scan code to check authenticity



Duty Cycle NVNT 1-DH5 2480MHz Ant1

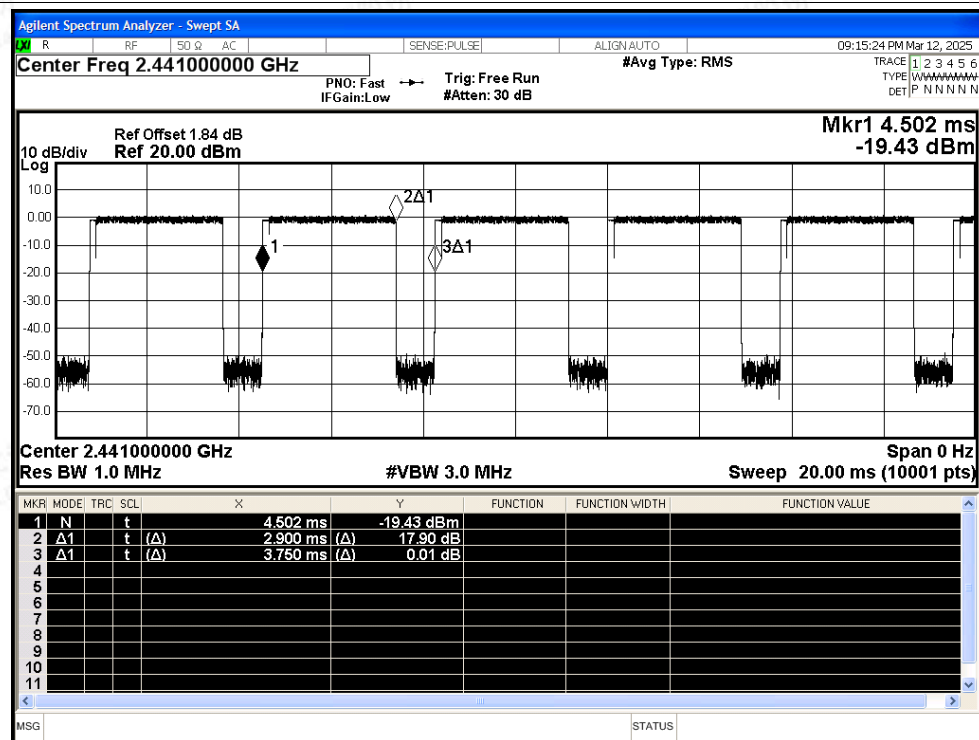


Duty Cycle NVNT 2-DH5 2402MHz Ant1

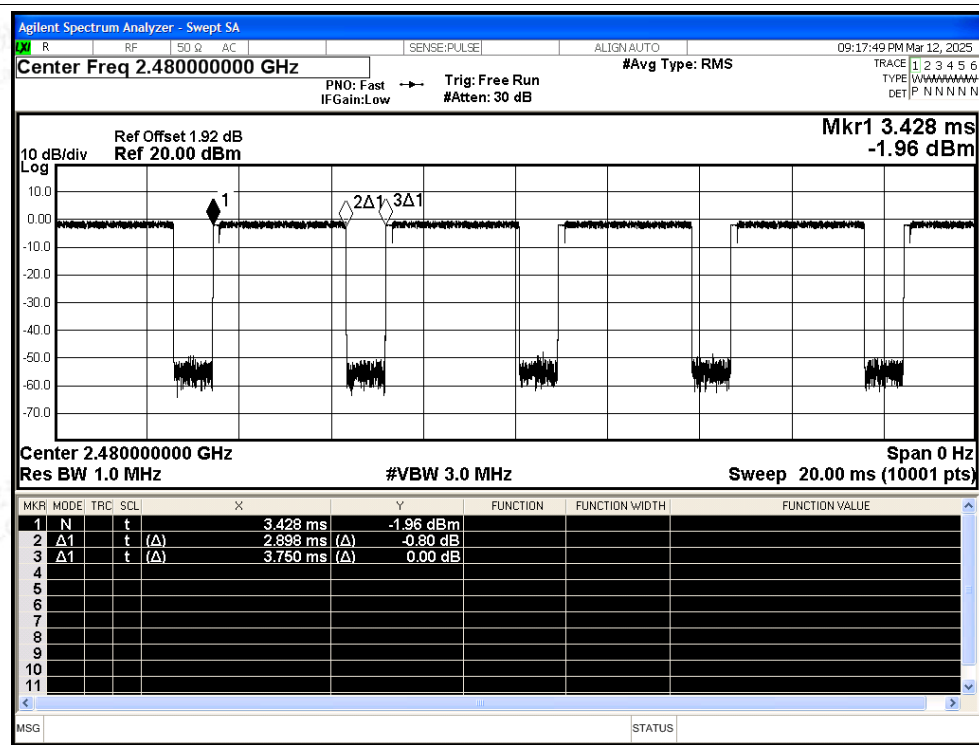




Duty Cycle NVNT 2-DH5 2441MHz Ant1

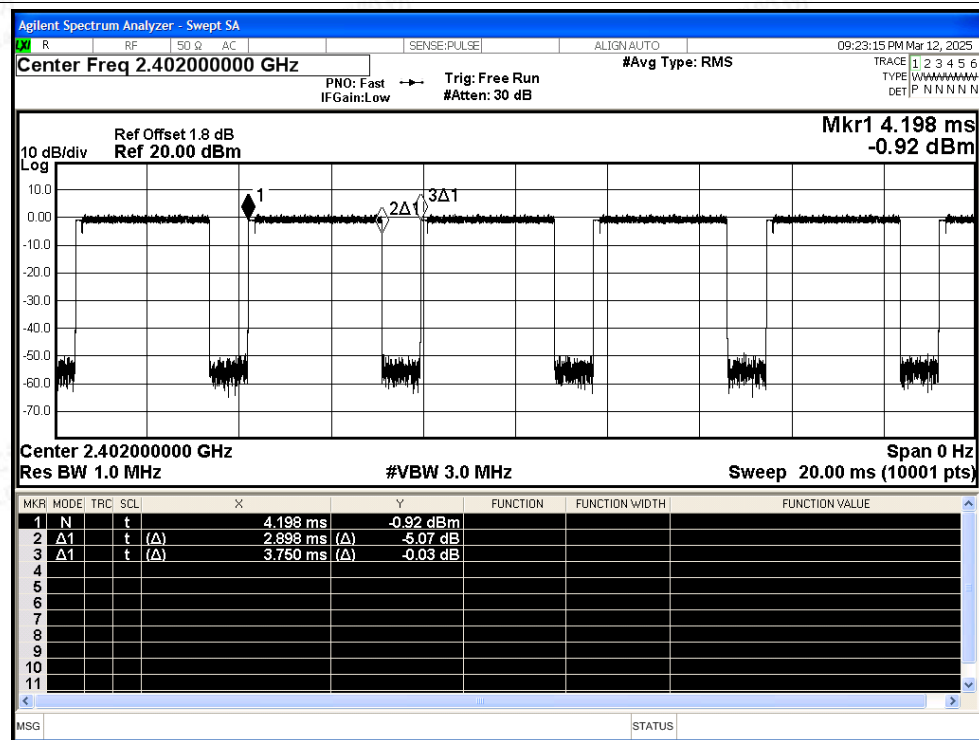


Duty Cycle NVNT 2-DH5 2480MHz Ant1

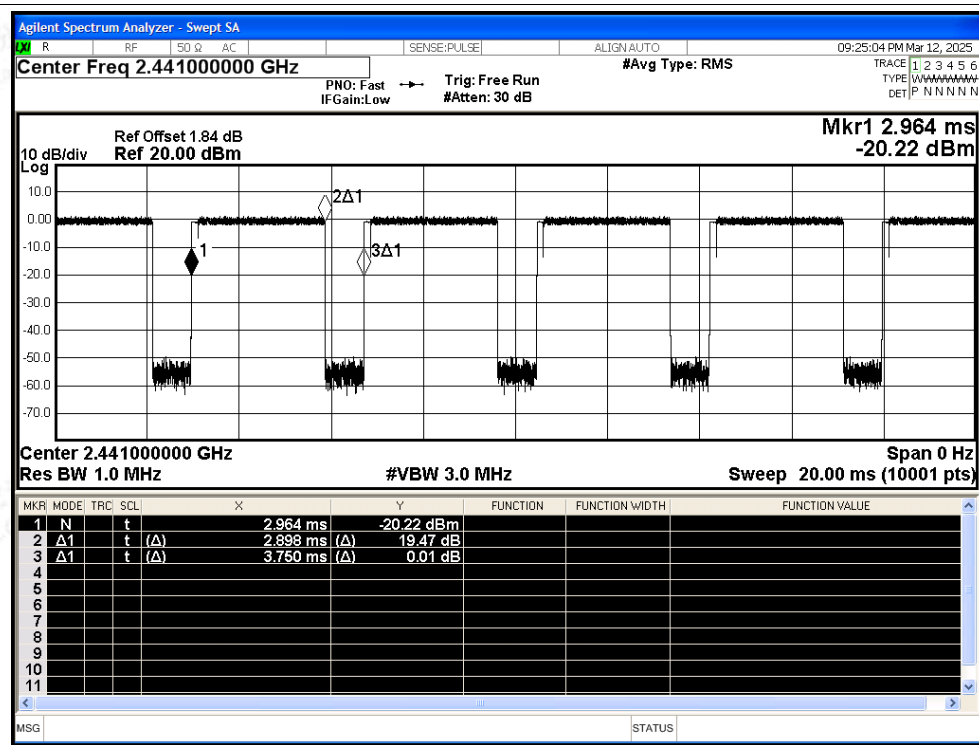


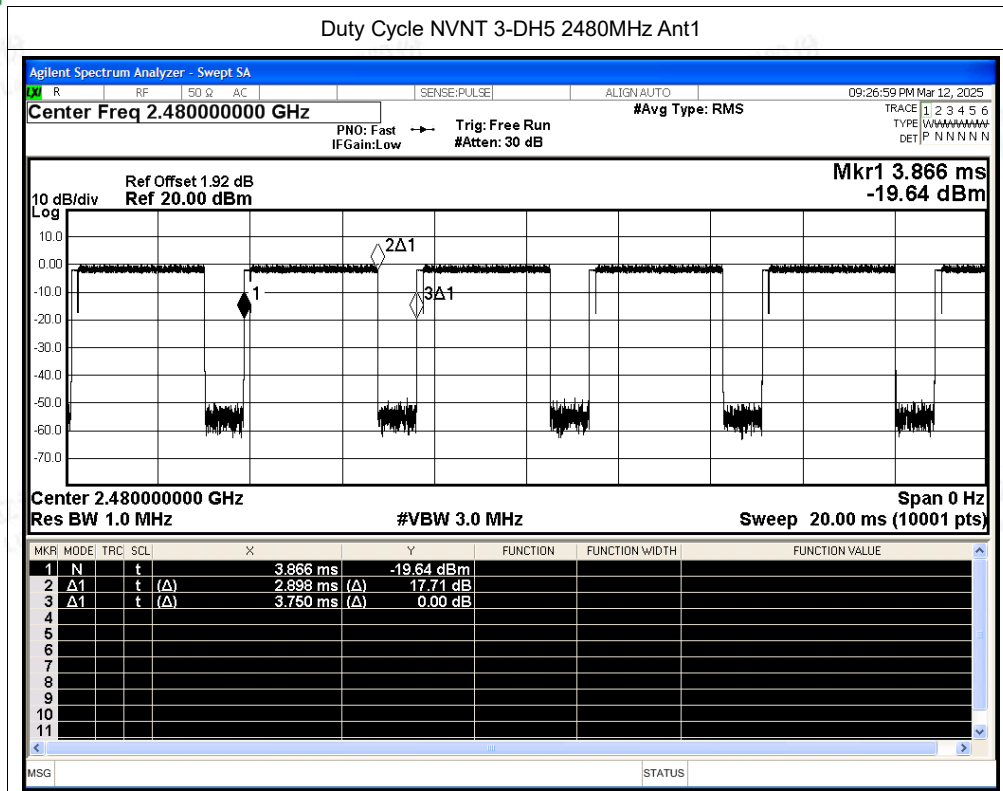


Duty Cycle NVNT 3-DH5 2402MHz Ant1



Duty Cycle NVNT 3-DH5 2441MHz Ant1







A.9 Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-49.68	2.21	-	47.79	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-59.3	2.21	1.1	39.27	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2361.84	-47.05	2.21	-	50.42	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2384.112	-57.91	2.21	1.1	40.66	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-51.35	2.21	-	46.12	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-58.36	2.21	1.1	40.21	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-49.99	2.21	-	47.48	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-57.96	2.21	1.1	40.61	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.968	-45.76	2.21	-	51.71	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2493.52	-57.41	2.21	1.1	41.16	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-50.09	2.21	-	47.38	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-58.5	2.21	1.1	40.07	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-51.48	2.21	-	45.99	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-58.96	2.21	1.12	39.63	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2377.392	-47.64	2.21	-	49.83	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2389.584	-57.87	2.21	1.12	40.72	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-50.52	2.21	-	46.95	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-58.75	2.21	1.12	39.84	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-49.94	2.21	-	47.53	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-57.58	2.21	1.12	41.01	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2488.72	-46.65	2.21	-	50.82	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2486.32	-57.25	2.21	1.12	41.34	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-50.84	2.21	-	46.63	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-58	2.21	1.12	40.59	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-50.99	2.21	-	46.48	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-59.11	2.21	1.12	39.48	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2343.024	-46.87	2.21	-	50.6	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2355.12	-58.05	2.21	1.12	40.54	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-49.98	2.21	-	47.49	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-58.61	2.21	1.12	39.98	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-48.51	2.21	-	48.96	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-57.16	2.21	1.12	41.43	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2486.872	-44.97	2.21	-	52.5	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.512	-57.16	2.21	1.12	41.43	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-49.21	2.21	-	48.26	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-57.6	2.21	1.12	40.99	Average	54	Pass



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

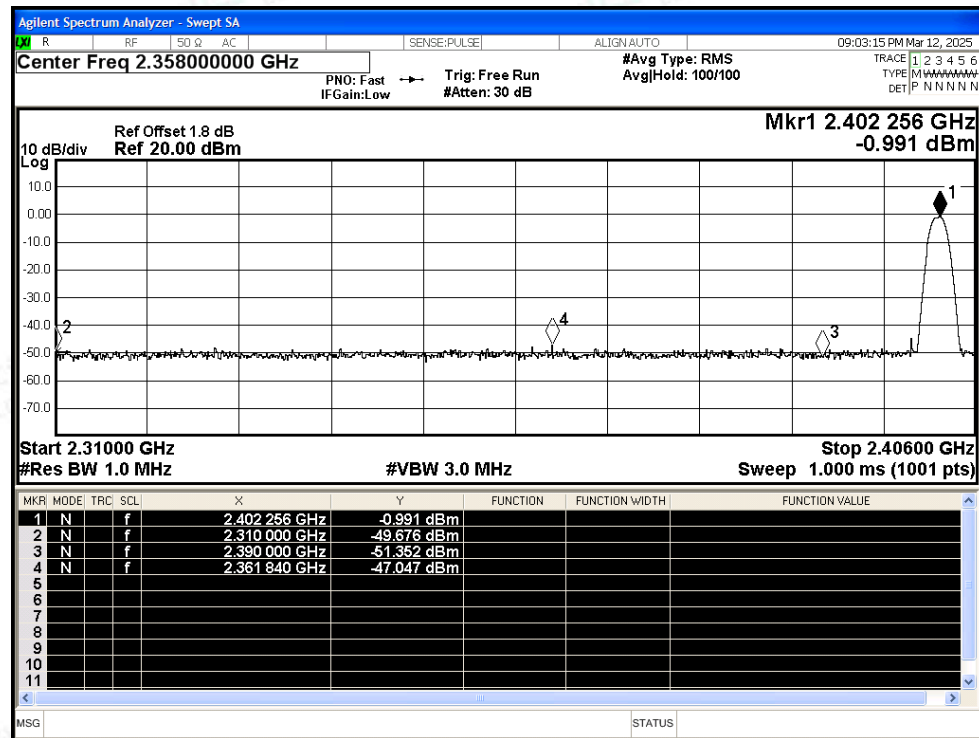
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

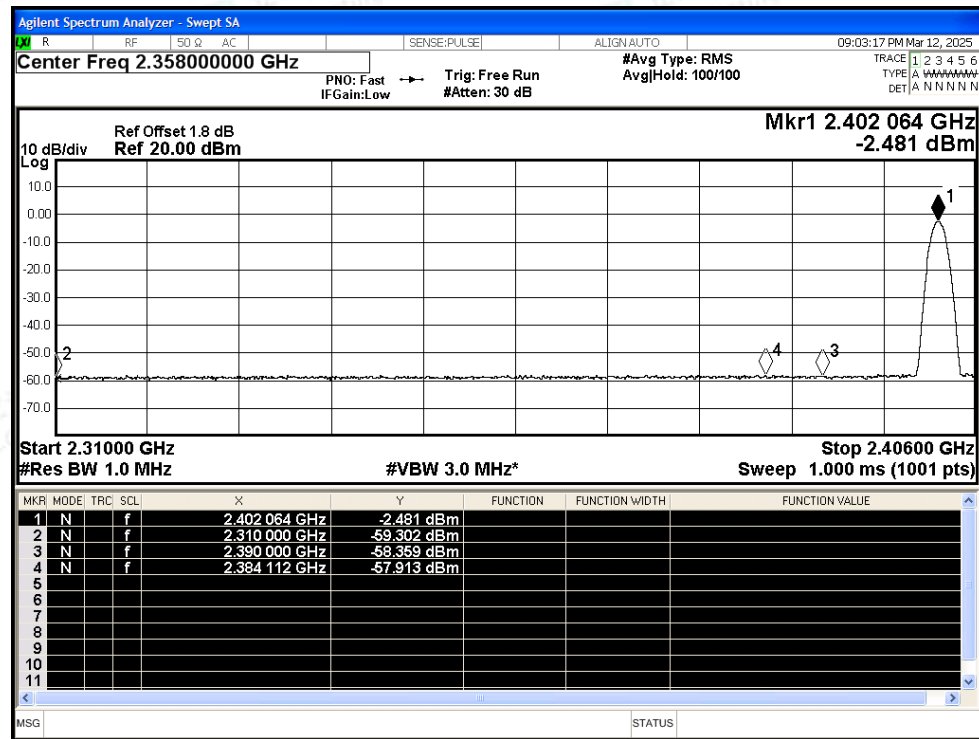


Test Graphs

Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Peak

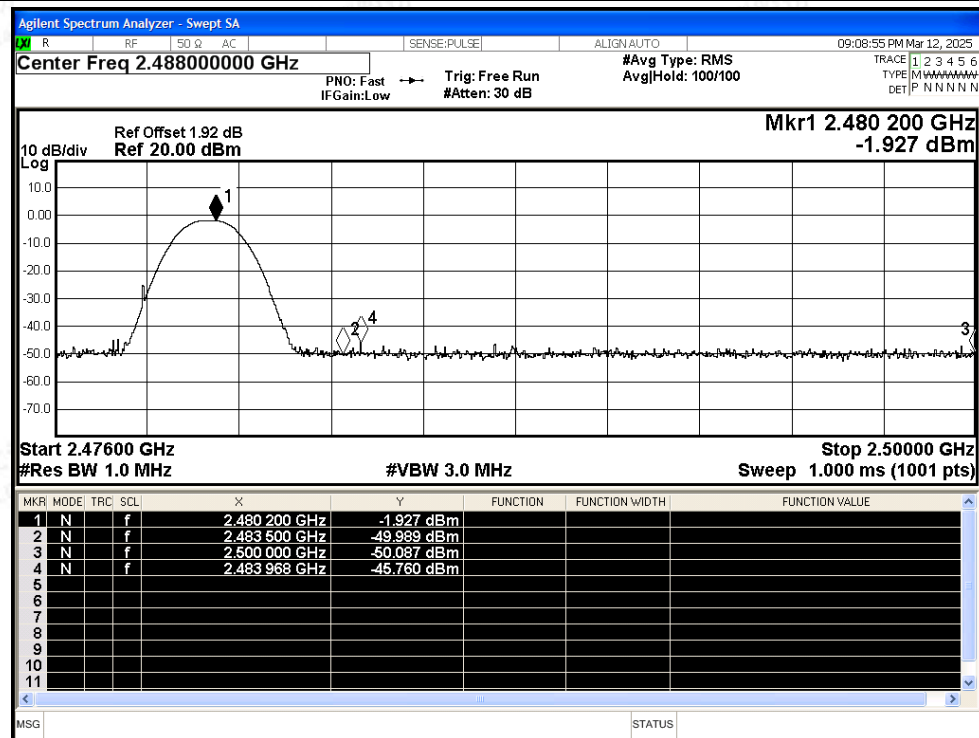


Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Average

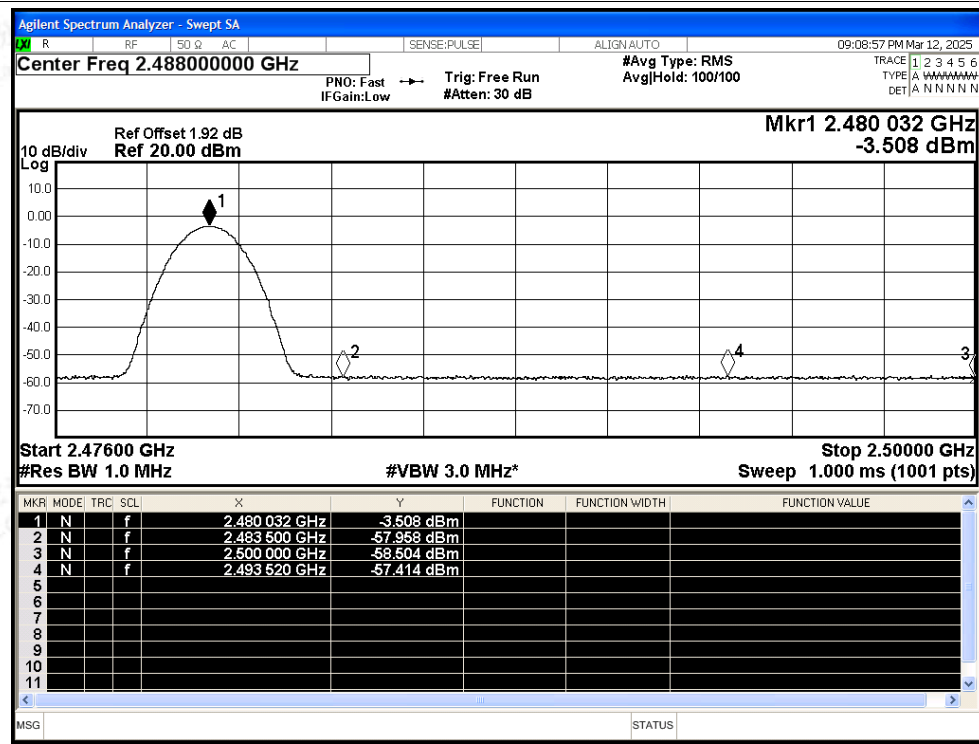




Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Peak

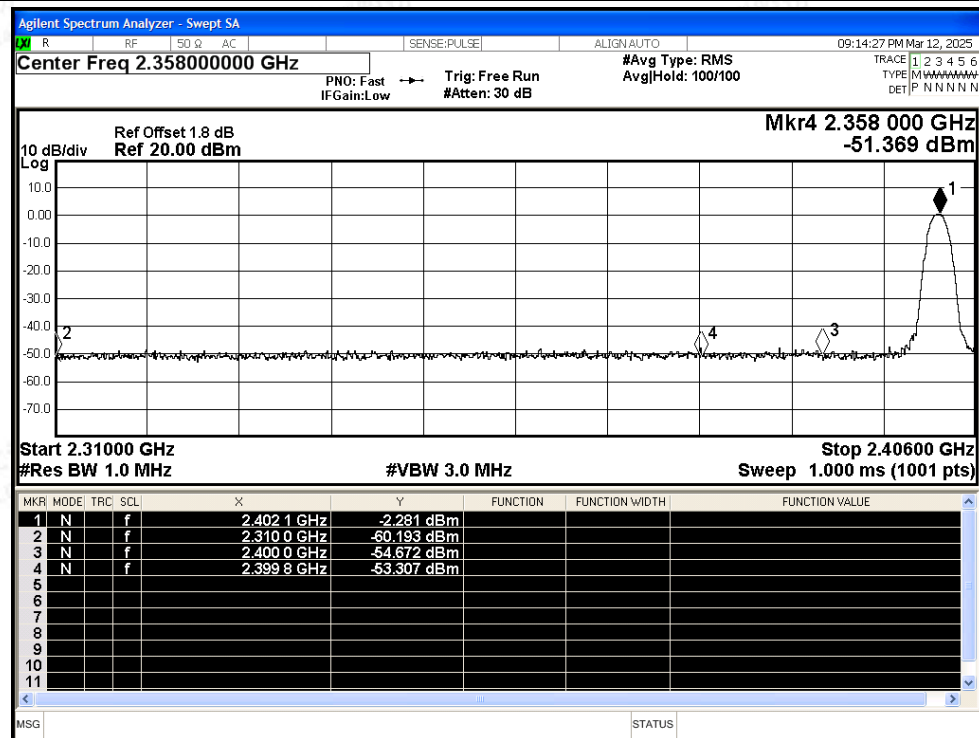


Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Average

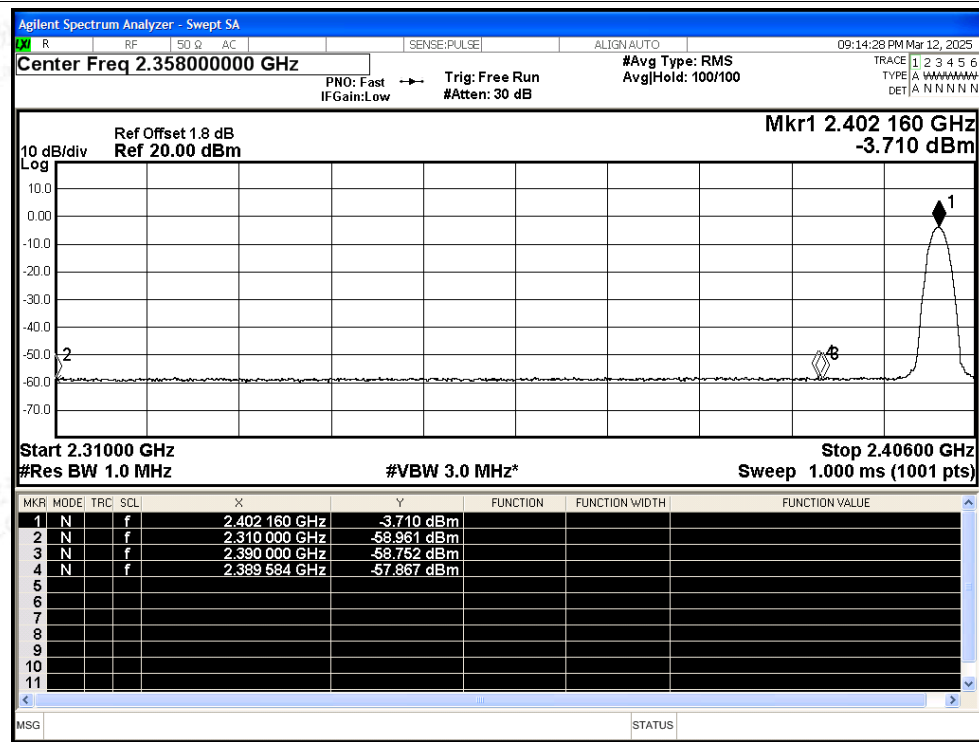




Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Peak

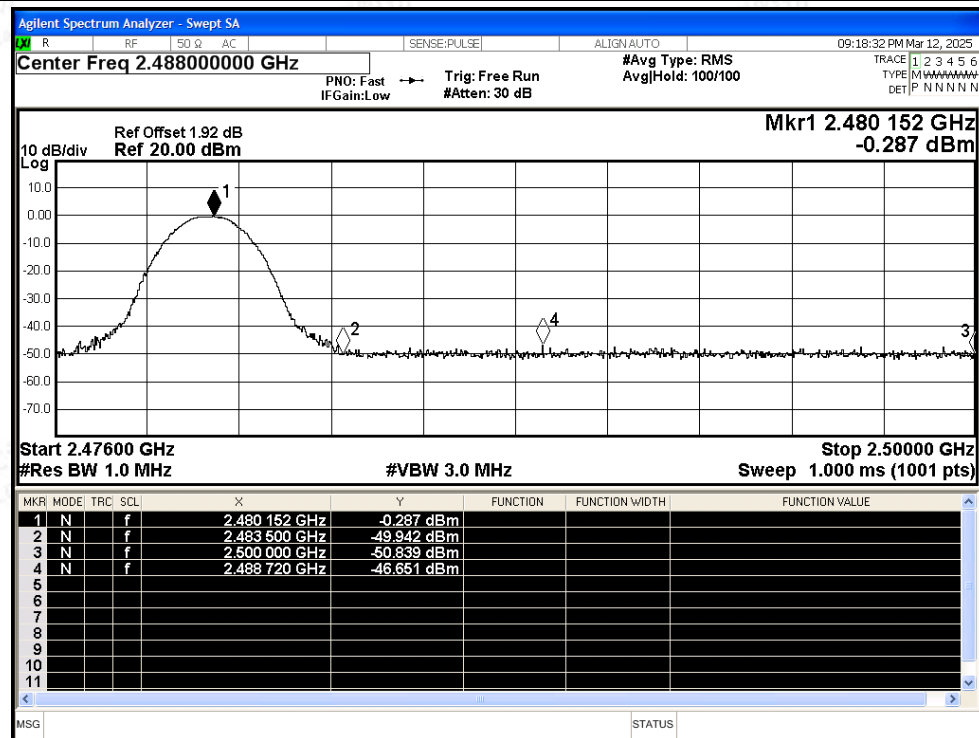


Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Average

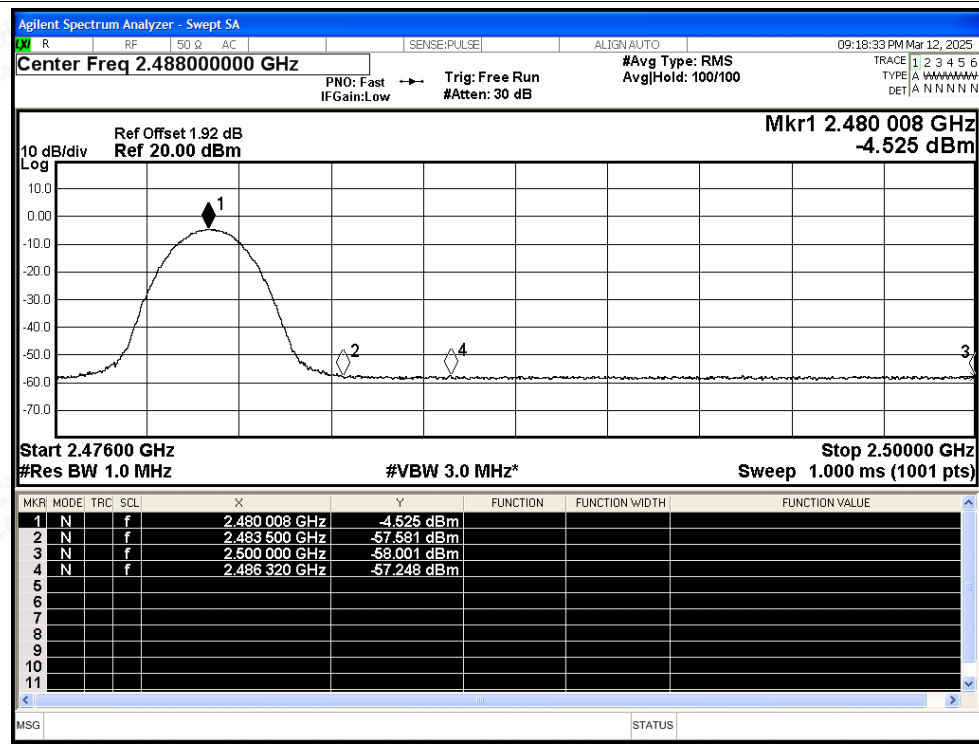




Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Peak

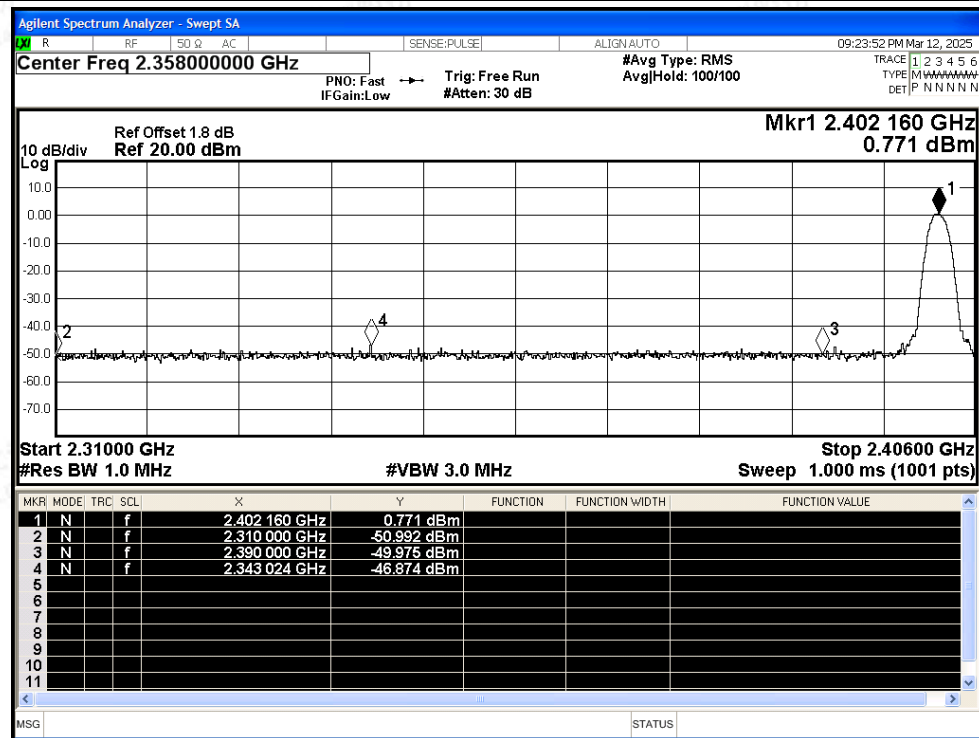


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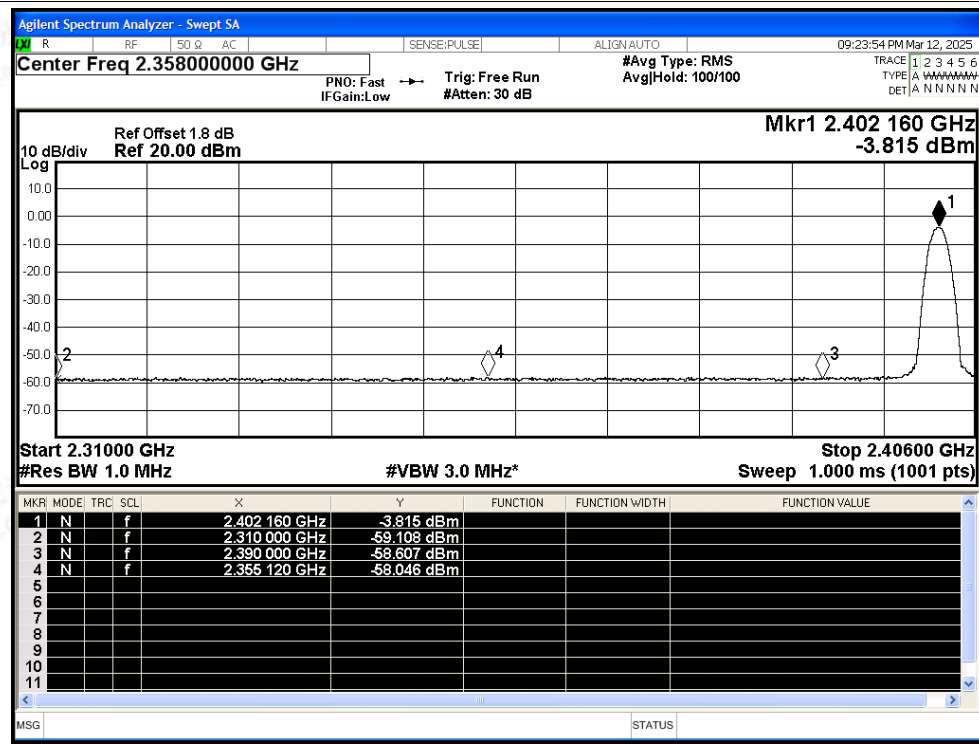




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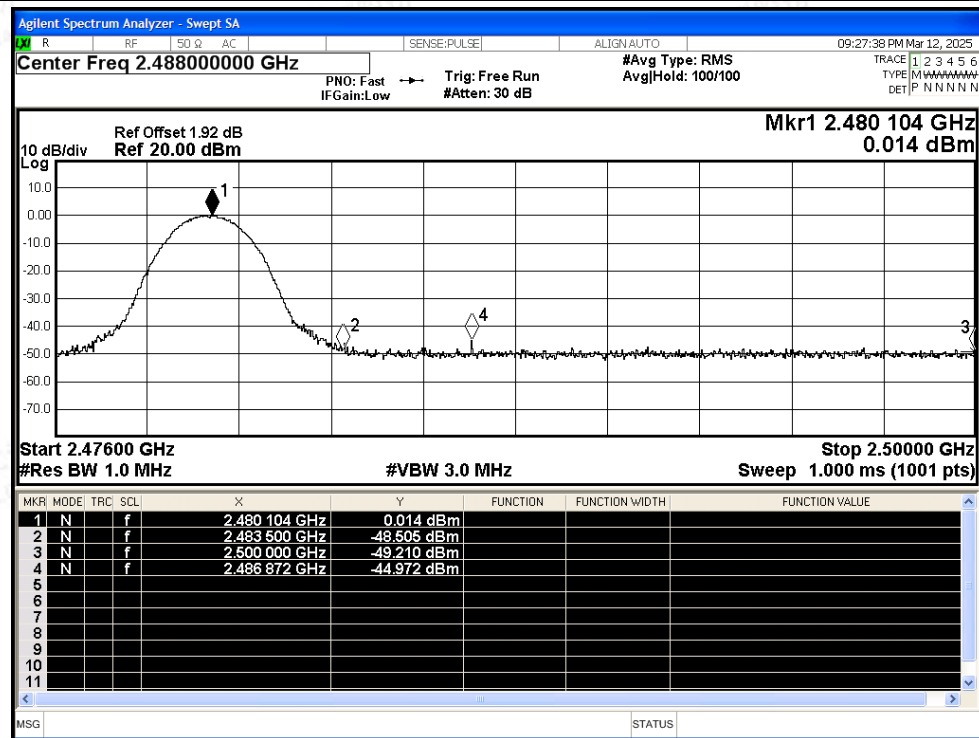


Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Average





Restrict Band NVNT 3-DH5 2480MHz Ant1 No-Hopping Peak



Restrict Band NVNT 3-DH5 2480MHz Ant1 No-Hopping Average

